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Recent Developments in the Field of Public Health Statistics*

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THE problem of obtaining the statistics needed in the field of public health is an extraordinarily complex one. Probably the best developed statistics used by the public health are those of mortality and, to a lesser degree, the statistics of birth and the communicable disease reports. In contrast with mortality, the statistics of sickness are quite fragmentary, coming largely from survey information of one type or another. In spite of the general inadequacy of the reportable disease data, there seems to be few suggestions as to how they should be improved. Marriage and divorce statistics are also of importance in the field of public health, but national statistics on this subject are quite primitive and limited largely to the total counts collected from counties and states.

Most of the major communicable diseases have been largely conquered. Health departments are now broadening their activities, entering such fields as chronic disease control, problems of hospitalization and medical care, the maintenance of good health during old age, etc. With this expansion comes the need for more comprehensive statistical analysis to increase the effectiveness of planning, direction, and evaluation of operations. Special studies are important to an increasing degree. Eventually, such studies must deal with the relation between disease and social, economic, biological and environmental factors. For effective results, the administrator, statistician, and other members of the health department must approach the problem at the *planning stage* and *work as a team.*

The complex and numerous fragments of the public health statistical pattern might be likened to a mosaic which has only been partially put together. The many fragments of data and the methods used to collect them are but pieces of this mosaic. Some of them have been fitted into place so that a design has begun to appear; others are still quite detached from the main picture. Many of the tiles which will ultimately become a part of the mosaic have not even been designed as yet. Particularly is this true of the adaptation of modern sampling procedures to the health statis-

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tical problem, and the lack of a vital statistics index which will link together the various vital records of a person and thus give rise to the "longitudinal" type of statistics needed for many purposes.

Much of the complexity of the public health statistics mosaic comes from the fragmentation in subject matter through which the health problem is so frequently approached. Programs are sold to legislatures, disease by disease. Venereal disease control, tuberculosis control, heart disease, mental hygiene, industrial hygiene—the money is usually appropriated in accordance with the emotional interest of the public. Each subject receiving the "green light" naturally turns to records and statistics in order to obtain a factual basis for program planning, program control, and program evaluation. Little wonder that many of the pieces in our mosaic have not been fitted together, when the interests of the groups promoting them have been so narrowly specialized.

Furthermore, the complexity is increased by differences in requirements at the different administrative levels—the county, city, state, nation, and the world. All have their particular areas of emphasis. Patterns laid down by national groups frequently need to be tailor-made at the local level in order that the greatest usefulness for the locality may be realized. On the other hand, the solution of local and state problems sometimes must await the emergence of a standard on a world-wide basis. An example of this is the *International Statistical Classification of Diseases, Injuries and Causes of Death*. It would have been almost impossible to obtain the use of a single classification for morbidity within the United States, even within the states and cities, if this world-wide *International Statistical Classification* had not emerged.

Many of the difficulties in perfecting the mosaic arise from the fact that jurisdictional interests make it difficult to bring about a sufficient degree of uniformity so that the various tiles in the mosaic will fit together to form a picture. It is for these reasons that this discussion emphasizes the truly great recent achievements in the establishment of coöperative mechanisms which make it possible to come to grips with the problems of public health statistics and overcome barriers which have tended to suppress an overall solution.

INTERNATIONAL DEVELOPMENTS

One milestone in progress is the world-wide acceptance of the Sixth Decennial Revision of the *International Lists of Diseases and Causes of Death* as adopted by the International Conference which met in Paris from April 26 to 30, 1948.

The Fifth Decennial Revision Conference, held in Paris during 1938, which produced the Fifth Decennial Revision of the *International List*, recognized the growing need for comparable morbidity statistics, and therefore adopted a resolution urging that the various national morbidity lists be harmonized into a single international list. It also recommended that the United States Government continue its studies of the statistical treatment of joint causes of death.

In 1945, in compliance with this resolution, the Secretary of State created the United States Committee on Joint Causes of Death, which included representatives from the United Kingdom, Canada, and the League of Nations. At its first meeting, the committee decided that, in addition to the matter of joint causes, it would be advantageous to attempt the development of a morbidity list and see if it might be possible to do this in such a way that it could be fused with the mortality classification. After a great deal of work, a *Proposed Statistical Classification of Diseases, Injuries and Causes of Death*, for the compilation of morbidity statistics, was pro-

duced by this United States Committee and tried out in various hospitals of England, Canada and the United States. The work of the United States Committee was then turned over to an Expert Committee created by the Interim Commission of the World Health Organization in 1947. No reservations were attached to its modification or use. The Expert Committee, after considerable additional work and clearance with the health and statistical authorities of the various governments throughout the world, used a modification of this proposed classification as a basis for the International Conference held in Paris in the spring of 1948. During June and July, 1948, appropriate committees of the First World Health Assembly reviewed the work and resolutions produced by the Sixth Decennial Revision Conference and incorporated these recommendations into its Regulations No. 1 which have now been sent to all of the participating governments and were acceptable to them. In the United States, the new classification went into effect on January 1, 1949. It has been accepted by all of the state health departments without reservation. An English edition of the *Manual of the International Statistical Classification of Diseases, Injuries and Causes of Death*, which contains this list, together with supplementary material and an index to the medical and death terminology, is being published by the World Health Organization for all of the English-speaking nations of the world.

Almost as important as the achievement of the *List* itself was the establishment by the Paris Conference of a uniform pattern for medical certification. This standard medical certification form lays emphasis on the underlying cause of death as determined by the attending physician, and, with its adoption throughout the world, more meaningful information for public health purposes will be derived. For the most part, the state registrars in the United States have already adopted the new medical certification form recommended by the Conference and reaffirmed by the World Health Assembly in its Regulations No. 1.

Much effort had been made on the part of the personnel in state vital statistics offices and in the National Office of Vital Statistics to insure consistent use of the new *List* through uniform coding practices for causes of death throughout this country. This effort has been made largely through training institutes conducted in various parts of the country on numerous occasions, and through comparison of state and federal code assignments on a 10 per cent sample of death certificates.

The extraordinary contribution of the United States Committee on Joint Causes of Death in its preparatory work in connection with the *International Statistical Classification* which was adopted was recognized by the Paris Conference. It was acknowledged that a considerable amount of national energy had been contributed to laying the groundwork for an international achievement. The Conference desired that this process continue to be applied to international statistical problems in the future. Consequently, one conclusion of the Paris Conference, which might well be more far-reaching than the emergence of the combined morbidity-mortality classification itself, was the proposal of an international working pattern which recognizes the importance of *direct participation* by national technicians in the field of international health statistics.

The general pattern was laid down by Resolution No. 8 of the Paris Conference which specified:

(1) That an Expert Committee on Health Statistics be created by the World Health Assembly with broad authority to study the statistical problems in the fields of health, including those connected with the registration of births, diseases and deaths; (2) that the Expert Committee decentralize the study of

some of these problems to interested and appropriate national health and statistical agencies which are willing to undertake such work and that the Expert Committee undertake periodic review and international clearance of viewpoints concerning such projects; (3) that the World Health Organization develop its statistical service to such technical competence as to enable it not only to carry out statistical functions within the Organization and to implement the recommendations of the Expert Committee on Health Statistics, but also to furnish consulting service to national Health Administrations and Statistical Agencies; (4) that the World Health Organization convene, as occasion indicates, international technical conferences on problems in the field of vital and health statistics; and (5) that in carrying out this work effective coöperation be established and maintained with the interested services of the United Nations and Specialized Agencies.

In order to define more clearly what was meant by decentralizing study to national statistical agencies, the Paris Conference drafted a special resolution concerning National Committees on Vital and Health Statistics. This reads as follows:

(1) That all governments establish, either singly or jointly, National Committees on Vital and Health Statistics composed of representatives of administrations entrusted with the compilation of such statistics; (2) that such national committees study broadly the problems of producing satisfactory national and international statistics in the field of health; (3) that these national committees also study the problems of producing health statistics which are related to the family structure and to the social-economic and occupational background of the individual; (4) that these national committees in tropical regions pay particular attention to the statistics needed for tropical diseases; (5) that these national committees in countries facing the problems of population pressure and malnutrition pay particular attention to the statistics needed for these problems; (6) that all national committees coöperate with schools of medicine and public health so as to come to grips with the problems of statistical education and training in the field of vital and health statistics; (7) that in view of the interest signified by delegates from various countries at the Conference: (a) The competent authorities of Belgium, France and Switzerland study the question of completeness and accuracy of Medical Certification of Causes of Death in relation to the confidential character of the certificates; (b) the competent authorities of Canada and the United States of America prepare an adaptation of the International Statistical Classification of Diseases, Injuries and Causes of Death to the needs of the Armed Services; (c) the Canadian and United States National Committees, individually or jointly, pay particular attention to the methods by which health statistics might be interlinked with other types of related statistics and in such a manner that they will be based on a knowledge of the characteristics and distribution of the population; (d) the Vital Statistics Administration of Switzerland, the United Kingdom and the United States of America study methods of presentation of statistics of multiple causes of death; (e) the competent authorities of Denmark, France, Norway, Switzerland and the United Kingdom pay particular attention to the problem of cancer registers and statistics; (f) the competent authorities of the United Kingdom and of the United States of America pay particular attention to the methods for obtaining reliable statistics on the frequency and causes of foetal death (classification of periods of gestation under 28 weeks, classification of multiple causes, methods of certification); (g) the competent authorities of France and India pay particular attention to the problems of morbidity and mortality from tropical diseases; (h) the competent authorities of Ecuador, India, Italy and Venezuela study the problems involved in the statistics of malaria morbidity; and (8) that these national committees shall report their findings and recommendations, from time to time, to an Expert Committee of the World Health Organization for international consideration, clearance of national viewpoints and coördination with the interested statistical services of other intergovernmental organizations.

The First World Health Assembly approved both of these resolutions and recommended them to the member nations. Acting on this international recommendation, the United States Department of State requested the Federal Security Agency to form such a national committee in the United States. The Surgeon General of the Public Health Service thereupon constituted the United States National Committee on Vital and Health Statistics. Dr. Lowell J. Reed, Vice-President of Johns Hopkins Uni-

versity, was selected as Chairman. From the very start, Dr. Reed laid down the principle that members of the committee must not represent their organizations or agencies, but rather that they should be chosen to represent a point of view, an area of interest, or a field of knowledge essential to the committee's responsibilities.

Following the announcement in February, 1949, that a National Committee on Vital and Health Statistics was being created for the United States by the Surgeon General of the Public Health Service, many questions have been raised from various sources as to what the committee intended to do and how it would function. During the formative months, no descriptive statement was issued because the committee itself, as its first order of business, has been attempting to find an answer to these various questions. A general descriptive statement has been prepared and is now available.

By the nature of its conception, the committee has the primary function of serving as an intermediary in matters concerning vital statistics and public health statistics between national and international organizations. The committee recognized that there are a great many national organizations and national committees of various types operating in specialized portions of these fields in the United States. Furthermore, the committee felt that it should not minimize or take over any of these activities or interests in fulfilling its own responsibilities. Quite the contrary, it realized that its primary responsibility and its greatest opportunity was to channel United States viewpoints and "know-how" existing in these statistical fields into international bodies and organizations which might consider them and adapt them for broad international usage.

To date, the committee has had two meetings, the first on February 2, 1949, and the second on July 14, both in Washington, D. C. Much of its time at these two meetings was devoted to consideration of the committee's frame of reference and how it should function. The functions of the committee have now been defined to be: (a) Delineate statistical problems of public health importance which are of national or international interest; (b) stimulate studies of such problems by other organizations whenever possible or make investigations of such problems through working groups appointed for the purpose; (c) review findings of studies, and make recommendations for national and international adoption; (d) coöperate with other committees or organizations concerned with public health statistics in the United States so as to serve as a clearing house for activities dealing with public health statistics problems; (e) serve as a link between the organizations in the United States engaged in public health statistics and the Expert Committee on Health Statistics and the Statistical Secretariat of the World Health Organization, and also other international agencies concerned with public health statistics; and (f) coöperate with national committees of other countries in the study of problems of mutual interest.

The national committee proposes to appoint technical subcommittees or working groups to study various problems in the field of vital and health statistics. In its initial actions, the committee designated temporary working parties to explore the possible courses of action that might be taken with respect to the following problems: "Adaptation of the *International Statistical Classification of Diseases, Injuries and Causes of Death* (within its framework) to the Special Needs of the Armed Forces," "Method of Linking Together Health Statistics With Other Related Statistics," "Method of Obtaining Reliable Statistics on Fetal Deaths," "Method of

Presentation of Hospital Morbidity Statistics," and "Problems of Medical Care Statistics and Case Registers." Subcommittees will be appointed later to make full-scale studies of these subjects.

Considerable progress has also been made by the World Health Organization in advancing the concept of National Committees on Vital and Health Statistics. The Expert Committee on Health Statistics, recommended by the Sixth Decennial Revision Conference in Paris, was approved by the First World Health Assembly and duly organized by the World Health Organization. It had its first meeting during May, 1949, at which time a basic and far-reaching recommendation was made in connection with national committees.

(1) That the World Health Organization renew its efforts through normal channels to foster the creation of national committees, to suit their particular needs in the field of medical and public health statistics. (2) That the World Health Organization Secretariat issue an informative document setting forth the motives and background for the establishment of National Committees on Vital and Health Statistics, emphasizing their objectives, suggesting problems which might need solution, and reporting on the present status of those national committees already organized. (3) That this document be amply supplied to governments for distribution to interested national organizations, and supplied also to those national committees (or their national equivalents) already in operation. (4) That a focal unit for maintaining relationship with national committees (or their equivalents) be established in the World Health Organization Secretariat. This will include: (a) An exchange service for national committees, reporting on their work and supplying information which might be of value to them; (b) a Consulting Staff adequately provided with funds for travel and other necessary expenses so as to enable them to assist national committees in their programs. This staff to include not only World Health Organization officers but also specially qualified consultants who will assist such a national committee, other than their own, which may ask for their help. The duration and the character of this aid and the methods to be followed shall be established by agreement between the World Health Organization and the interested parties. (5) That the World Health Organization should initiate an international conference of representatives of national committees to be sent at the expense of their respective governments, this meeting to be held early in 1952.

This recommendation of the Expert Committee has been approved by the Executive Committee of the World Health Organization. By this means, the establishment of an active secretariat in the World Health Organization to service the national committees has been assured.

Following the action laid down by the World Health Organization, the promotion of National Committees on Vital and Health Statistics has been actively sponsored in the Western Hemisphere by both the Pan American Sanitary Bureau and the Inter-American Statistical Institute. This subject will be one of active interest at the coming Second Inter-American Statistical Congress to be held in Bogota. It is anticipated that the majority of the nations in the Western Hemisphere will have organized their national committees by the end of the current year.

The importance of this movement, backed solidly as it is by international organizations, can hardly be overemphasized since it means that national technicians working directly with the problems of public health statistics will be able to express their view and divert some of their energies and resources into the solution of problems involving methodology and standards in this field. Furthermore, it will root in each country a committee which will rise above the jurisdictional interests of the numerous agencies and organizations working in various phases of the field and thus serve a dual purpose, national and international.

NATIONAL DEVELOPMENTS

The current developments in Ameri-

can public health statistics largely center around six organizations: the American Statistical Association, the Population Association of America, the American Association of Registration Executives, the American Public Health Association, the Public Health Conference on Records and Statistics, and the National Office of Vital Statistics.

The American Statistical Association has as its purpose the improvement of basic statistical data and statistical methods in many fields of knowledge; the fostering of contact and discussion among persons seriously concerned in statistical problems and methods; and the encouragement of the use of statistics in research and practical affairs. It has always taken a vital interest in improving the sources of demographic data in government and through its Committee on Government Statistics and Informational Services was responsible for reorganizing the vital statistics work of the federal government in 1935.

The Population Association of America was organized in 1932 and has as its purpose the promotion of the improvement, advancement, and progress of the human race by means of research with respect to problems in connection with the human population in both its quantitative and qualitative aspects and by publication of the results of such research. Vital statistics is, therefore, a major part of its interest, in particular the relation of health statistics to the demographic base.

The American Association of Registration Executives was organized in 1933, as a specialized group from the Vital Statistics Section of the American Public Health Association. The purpose of the association is to afford an opportunity for the state registrars to exchange views on registration and administrative problems. The association has unique value, due to the selectivity of its membership and its freedom from all federal governmental subsidies. It might well be characterized as the trade guild of the registrar.

The Statistics Section of the American Public Health Association was organized as the Vital Statistics Section in 1907. The purpose of the section at that time was:

> To bring about a closer official and personal association of the registration officials of the several countries (Canada, Cuba, Mexico, and the United States) composing the American Public Health Association; to promote the introduction of effective systems of registering vital statistics for public health and legal purposes; to aid the adoption of uniform methods of collecting, preserving, correcting, and compiling registration records, and of publishing the statistical data derived therefrom in the most useful form, especially for sanitary purposes; to conduct the active coöperation of the American Public Health Association with the Government agencies of each country and with other organizations interested in the improvement and use of vital statistics; to report on the actual condition of the International Classification of Causes of Death as employed in vital statistics reports and bulletins, and to formulate recommendations for its decennial revision; to help in the better reporting and classification of the mortality of occupations; to present and discuss papers relating to vital statistics both in the section meetings and in the general sessions of the American Public Health Association; and in general to promote a proper appreciation of the necessity and importance of vital statistics as an absolutely essential basis of modern public health work, and to improve the character and status of registration service.

In recent years, and following the formation of a separate registration organization, the functions of the section have been centered around the presentation and discussion of papers at the annual meetings of the American Public Health Association and committee activities in the fields of health and vital statistics. One of the unique values of the section has been its ability to interrelate the viewpoints of public health statisticians with those of other technical branches of public health.

The functions and program of these four organizations are well understood.

More explanation is needed to clarify the structure and objectives of the recently organized Public Health Conference on Records and Statistics and the new orientation of the National Office of Vital Statistics in the Bureau of State Services in the Public Health Service.

Public Health Conference on Records and Statistics

For a number of years, the National Office of Vital Statistics and state registration officials have been in the process of developing a closely knit, working cooperative mechanism by which they might face their mutual problems.

In the fall of 1944, the Council on Vital Records and Vital Statistics was established to carry on projects of mutual interest to federal and state agencies. Although created in part because of the restrictions on travel due to war conditions, this organization proved to be so useful that it was continued even after the Annual Work Conference of the National Office of Vital Statistics could be resumed. Through the combined mechanism of the Work Conference, and the Council, and with the close coöperation of the American Association of Registration Executives and the Vital Statistics Section of the American Public Health Association, vital statistics and vital record problems of an interstate and national character have been considered jointly by state and national officials concerned, so that programs and solutions of national problems in this field have emerged through joint planning activities.

The effectiveness of this mechanism was so evident after the first four years that it was generally felt that its work should be expanded so as to include the broad field of public health statistics in addition to that of vital records and vital statistics. Successive drafts of new by-laws, establishing such an expanded organization, entitled the Public Health Conference on Records and Statistics, were developed, reviewed, criticised, and modified during 1948. In September, 1948, the fourth draft of the by-laws of the organization received the majority approval of registrars and vital statisticians throughout the country. It was then submitted to the members of the Association of State and Territorial Health Officers for their consideration and action. In November, 1948, it received the approval of this association.

The Public Health Conference on Records and Statistics was formally launched on May 17, 1949, as a full-fledged organization. It will have a meeting once a year which will be attended by representatives from all states and territories. Both the public health statistical interests and those of vital records and vital statistics will be represented at these meetings. The organization will have an Executive Committee to conduct interim business and also an active committee structure which will carry out the groundwork needed for the conclusions to be reached at its annual meetings. The National Office of Vital Statistics will make its resources available to the committees of the Conference in whatever way they desire.

The emergence of this Conference as a coöperative and officially recognized joint enterprise of federal and state technicians is of great importance to the future of public health statistics in the country. It will bring about combined federal-state coöperation in the planning stage.

Numerous advances have already been made, either through the coöperative mechanism of the Conference or its predecessor, the Council on Vital Records and Vital Statistics. The principal achievements which have resulted over the last year or two are: Development of an active committee structure for detailed studies on technical problems; progress toward more complete registration of birth; improvement in

methods of obtaining better quality and accuracy in registration procedure; national participation in the development of an international morbidity-mortality coding manual; nation-wide agreement on standard certificate forms for the registration of births, deaths, and stillbirths; progress toward the centralization of marriage and divorce records in state health offices; development and installation throughout the nation of a standard application form for the confidential verification of the facts of birth; agreement on a uniform system for numbering birth certificates in all states; adoption by many states of a small pocket-size birth card, certifying birth facts but omitting parental information; and the emergence of a nation-wide policy on the confidential nature of birth records and special registration problems of children born out of wedlock, children of unknown parentage, legitimated children, and adopted children. Progress on these subjects would have been made without the mechanism of the Conference, but it is felt that the tempo of progress has been greatly accelerated through this mechanism.

An example of the importance of these achievements is the nation-wide adoption by the states of the item "weight at birth" as an integral part of the revised live birth certificate. This opens the door for the first time for comprehensive studies on prematurity.

The statistical part of the activities of the Conference will be broadened and activated in the coming years so that the consideration of health statistical problems can take its place side by side with the activities which, up to the present time, have largely been directed toward the solution of registration problems. Some of the numerous statistical problems pressing for consideration by committees of the Conference are: Analysis of data resulting from mass surveys for use in control programs of cancer, diabetes, tuberculosis, and heart disease; statistical by-products of case registers; adaptation of modern sampling procedures to local, state, and national programs; current problems of mortality statistics; development of comparable statistical data on prematurity; and the improvement of morbidity statistics.

The National Office of Vital Statistics

The reorientation of the National Office of Vital Statistics during the last year is also a factor of considerable national importance in the field of public health statistics.

In the detailed study performed by the Bureau of the Budget in 1943 at the request of President Roosevelt, the recommendation was made that a national vital records office should be established as a separate organizational unit in the U. S. Public Health Service. In making this recommendation, the Bureau of the Budget had before it the findings of the Vital Records Commission, activated at the request of the Association of State and Territorial Health Officers by the Federal Security Administrator. The Bureau of the Budget felt that, although the Public Health Service had relatively little experience in compiling vital statistics, it did maintain close working relationships with state health authorities responsible for the registration of basic vital records and that, consequently, the proposed relocation would permit the close intermeshing of morbidity with mortality facts which would be of considerable benefit to public health programs throughout the country. The Division of Vital Statistics, Bureau of the Census, was transferred in July, 1946, and has now become the National Office of Vital Statistics, located in the Bureau of State Services of the Public Health Service. In this new position, in addition to its classic function of collecting, tabulating, analyzing, and publishing the vital sta-

tistics of the United States, it now has, as a primary responsibility, the improvement of reporting and the analysis of morbidity statistics, consulting responsibilities to regional and state health departments in morbidity statistics as well as vital statistics, and wide authority to coöperate through the Department of State and with other federal agencies on international record and statistical problems.

The objectives of the Office have now been defined as: (a) To make available accurate and timely official national vital and health statistics designed to serve the broad purposes of public health and other scientific, public, and governmental activities; (b) to bring to maturity a coördinated nation-wide system of vital records, capable of serving efficiently the record and statistical needs of the individual and of cities, counties, states, and the nation; (c) to encourage, through coöperative arrangements, integrated record and statistical programs in the fields of health, welfare, and demography for cities, counties, states, and the nation; and (d) to approach these goals step by step, building upon the existing structure, through strengthening registration and statistical programs in local, state, and national offices and eliminating unnecessary duplication of effort and expense between local, state, and federal practices.

The Public Health Conference on Records and Statistics, described above, is served in every way possible by the staff of the National Office of Vital Statistics in order to facilitate and implement these objectives.

There are several gaps in the development of a national vital and health statistical system which need to be filled: (a) The improvement of morbidity reporting; (b) a broader interpretation of the significance of vital and health statistical information by cross-relating it to the social and economic background in which people live; (c) the development of satisfactory marriage, divorce, and family statistics which, at the present time, are limited to totals and permit no internal analysis; (d) the adaptation of modern sampling methodology for public health purposes at local, state, and national levels; and (e) the establishment of a vital statistics cross-index which will provide a mechanism for linking the important records of an individual, whenever and wherever they might be recorded, and thus permit "longitudinal" studies on individuals and families which are of great importance for health purposes. Essential progress in all of these activities can be made during the next 5 to 10 years as a normal growth of the coöperative mechanisms which are now in force.

The program in public health statistics here outlined has been approached by the National Office of Vital Statistics although only small sums are available for experimental and developmental purposes. A very high percentage of its resources is devoted to fulfillment of the classical responsibilities for collection and processing of data and the management of the coöperative arrangements described above. The National Office is not free to direct personnel and funds from its "bread and butter" tasks to accelerate development of morbidity statistics and marriage and divorce statistics. Therefore the development of new programs in these subjects will continue to be slow.

CONCLUSION

To summarize briefly, it can be concluded that the "pay-off" stage for years of planning and effort in both vital statistics and public health statistics lies immediately ahead. The coöperative local-state-national and international mechanism which has been created makes no problem *too* difficult to solve. A problem faced locally and an invention to solve it can now flow directly, as an idea, from the "grass roots" and

obtain world-wide consideration through normal direct channels. National and international standards can emerge as a joint coöperative enterprise *at the planning stage* between local, state, national, and international technicians. Jurisdictional considerations will lose their present dominance and all of us can concentrate on the real problems which need solution.

Association of Schools of Public Health

The Annual Meeting of the Association of Schools of Public Health was held at the Yale Medical School, New Haven, Conn., April 6 and 7, at which time James Stevens Simmons, M.D., Dean of the Harvard School of Public Health, Boston, was reëlected president; Edward S. Rogers, M.D., Vice-President, University of California, Berkeley, Calif., was elected Vice-President; and Ira V. Hiscock, Sc.D., Chairman of the Department of Public Health at the Yale University Medical School, New Haven, Secretary.

The Association went on record with respect to current bills in the U. S. Congress for aid to medical and public health education as follows:

"That the Association of Schools of Public Health, in line with previous testimony of its officers with respect to S-1453 and H.R. 5940, endorses the principles and objectives set forth in these bills as currently passed or revised and urges that these bills as now amended and after suitable adjustment of differences be passed by the Congress as a matter of urgency."

In addition, the deans discussed plans to broaden and improve courses provided by schools of public health, plans for increasing facilities of state and local health agencies for effective field training, the requirements of the American Board for Preventive Medicine and Public Health, Inc., and matters relating to accreditation procedures for schools of public health.

Morbidity Statistics—Do We Want Them?*

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SEVENTY-FIVE years ago a certain Dr. William Farr—whom some of you will have heard of no doubt—wrote these words in the Supplement to the 35th Annual Report of the Registrar General of England and Wales.

"The thing to aim at ultimately is a Return of the Cases of Sickness in the civil population as complete as is now procured from the army in England. It will be an invaluable contribution to therapeutics as well as to hygiene; for it will enable the therapeutist to determine the duration and the fatality of all forms of disease under the several existing systems of treatment in the various sanitary and social conditions of the people. Illusions will be dispelled; quackery as completely as astrology suppressed; a science of therapeutics created; suffering diminished; life shielded from many dangers."

Now when Farr wrote something as strong as that—and he frequently did—something generally came of it. There is still a saying among epidemiologists in England that if you think of writing a paper on any subject, the first step is to find out what Farr said about it. Experience has shown that it is dangerous not to do so, and I am taking the safe course. Why is it, we may ask, that not much notice seems to have been taken of this passage? I do not know what Farr meant by "ultimately," or indeed whether he inserted the word on the advice of a more cautious administrative colleague. The benefits which he said would follow were not of the kind people would be content to wait centuries for, and I conclude from his writings that patience was not outstanding among his virtues. Five years ago I quoted the passage in a paper to the Royal Society of Medicine in order to see what people thought of it after 70 years' reflection, and my impression was that the seed was then just beginning to germinate.

There are several reasons why morbidity statistics, although welcomed with enthusiasm in the abstract, often encounter heavy weather in practice. In England several attempts were made in the 19th century to collect fairly complete data from doctors or through Friendly Societies, in regard to illness in limited localities. They lasted only a few years and then expired, and other countries have had similar experiences. Little impression was left by these experiments because morbidity statistics need to be continued over a period of years before their value becomes evident. Contrast such failures with the very different history of mortality statistics—for example the London Weekly Bill of Mortality which, in rather different form, still goes on after more than 300 years. One reason is the magnitude of the data. Whereas a person dies only once, the average person in England consults a doctor about 300 times in a lifetime, and if records were to be assembled of the outcome of these consultations and nothing more, a multiplication of Pentagon Buildings might be required. And how should we deal with the ailments

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for which no doctor was consulted? It is hardly surprising that most of the morbidity statistics we have had up to now have been secondary products from data collected with incentives other than those which Farr enunciated so forcibly.

The first such incentive for collecting statistics of diseases was *protection of the community from infection,* which required the notification of certain infectious diseases. This has been going on for a long time and statistics derived from this source have proved of great value to epidemiology, apart from their immediate use in guiding action to be taken. It seems strange to me that so little serious attempt has been made to convert notification statistics into real morbidity statistics by ascertaining, or even estimating approximately, the proportion of notified incidence to total incidence of these diseases. After a discussion at the first meeting of the Health Statistics Committee of the World Health Organization, it was decided to ask nations publishing notification statistics to consider whether by any means estimates of the completeness of those statistics could be obtained and made known. There are ways of doing that, for example, for children entering and leaving school and men called up for military service information can be asked whether or not the child or man has ever suffered from certain diseases. Sampling surveys can be used for other diseases. In a recent study of "Sickness in the Population of England and Wales in 1944–47," I estimated that for acute poliomyelitis, meningococcal meningitis, and diphtheria, notifications after diagnosis correction by infectious diseases, hospitals provide good enough morbidity statistics, that measles is about two-thirds notified, whooping cough between a quarter and a fifth, respiratory tuberculosis about nine-tenths, and pneumonia from a third to a quarter at all ages, but varying greatly with age. I would like to urge that attention be given to this problem, so that notification statistics may become something more than mere numbers indicating trends. This may not be possible for whole countries but for cities such as New York it should be practicable to obtain measures of completeness of notification for the principal infectious diseases.

A second incentive has been provided by the financial and administrative aspects of *social security.* Life assurance companies like to know the life expectancy of people with certain chronic ailments, and some have introduced periodical examinations of policy holders to encourage early detection and treatment of new diseases. Social security and veterans' organizations had to keep records of sickness benefits and pensions, and from those records statistics about the more serious illnesses have been and will continue to be produced. Here I may mention also that the severe rationing of milk and certain foods in England necessitated the granting of special food allowances to people certified as suffering from active tuberculosis, diabetes, peptic ulcer, and some other diseases, and a register of these had to be kept. From that register the Food Ministry was able to compile statistics throwing light on the incidence of those diseases, since milk became so short in supply that most sufferers claimed their allowances. It was possible to use the resulting figures as a useful check on the incidence deduced from our Survey of Sickness, as I have shown in the report I have mentioned.

A third incentive has been the desire to keep employees in a maximum state of physical efficiency, not primarily because of solicitude for the individual workers but in order to *conserve man power.* Under this heading we have morbidity statistics of the armed forces and certain industrial sickness statistics.

A fourth incentive for collecting morbidity statistics has been to discover which of two *methods of treatment* of a

disease is the more effective. The outstanding example is cancer, for which radium and radiotherapy compete with surgery. Partly because these are expensive, but also for the patients' welfare, it is specially necessary to find out which gives the best results for each variety and site of malignancy. The answers could only be obtained from statistics of treated cases followed up for five or more years, and so radiotherapy institutes kept records and people tried to compare them with those of surgeons. The frailty of human nature being what it is, answers obtained in that way have not inspired great confidence. The Radium Commission in England consequently set on foot in 1945 a large-scale plan to register cancer patients presenting themselves for treatment, and laid it down that if centers wanted the loan of radium they must keep very precise records. The General Register Office is now receiving the cards and following up in the statistical sense over 50,000 new cases registered annually, including surgical cases.

A fifth incentive has been to aid administration and *improve efficiency of health services*. It is now being realized, in England at least, that the most effective and economical treatment is unlikely to be found in hospitals which do not keep good records. Some hospitals have had good internal records for a long time, but it has never been possible either to pool or compare them. Now that we have the *International Statistical Classification of Diseases*, an experiment is being made by which the General Register Office receives standard records of all inpatients discharged from each of the teaching hospitals of England and Wales, and also from hospitals of all types within a sample county and a sample city. The morbidity statistics accruing from this source have many aims in view, including pure research: but their indirect effects on the hospitals producing them and on the teaching of medical students are by no means the least important.

Mental hospitals and mental deficiency institutions throughout England and Wales have also, from the beginning of 1949, been sending to the General Register Office a detailed record card for each patient admitted. These cards give social and genetical data, diagnosis and history of mental illness. After transferring the data to punch cards, the original cards are returned to the hospital to be completed and sent in again when the patient is discharged or dies. The Ministry of Health will thus be able to see what happens to mental cases of all kinds admitted to the great bulk of mental hospitals and institutions. Although efficiency of administration was one incentive, the principal aim underlying these statistics of mental disorder is to increase our knowledge of their epidemiology with a view to prevention.

This brings me to the final incentive, namely, *to find out how the general health of the people is faring* in times of adversity and how it responds to measures intended to improve it. There is really only one practicable method of doing that, namely, a survey at regular intervals of different representative samples of the whole population. We started such a survey in England and Wales late in 1943, and it fulfils very well the purposes for which it was intended. Early in each month, a fresh sample of 4,000 persons over 16, properly distributed and randomly chosen within representative localities, is visited by field workers of the Social Survey. Details are taken of all ailments during the last two calendar months, together with social information. Participation is voluntary but the proportion of refusals is negligible. This survey provides us with about 100,000 months' experiences of over 50,000 separate individuals during a year, and now that most of the teething troubles are over we have an accumulating body

of statistical data to which we can turn in order to answer a multitude of questions. For general sickness trend curves, we have the monthly and quarterly rates, and for detail of morbidity by age, disease, occupation, income, housing, and so on, we can aggregate the data for one or more years.

Taking a few questions at random, how many adults suffer from migraine in the course of a month, how many from hemorrhoids, and how many suffer a burn? The answers from a year's statistics are 1 in 400, 1 in 170, and 1 in 300. How does the incidence of duodenal ulcer change with age? It increases up to middle age and then falls greatly. Do rural residents suffer as many colds as people living in towns? The answer in 1944 was yes, rather more. Are size of family and number of persons per room correlated with the frequency of sickness? Yes, but not so markedly as the death rate. How do agricultural workers compare with miners, clerks, transport and factory workers, and how do different income groups vary as to sickness rates, days of incapacity and visits to doctors? The answers from the data of 1947 and 1948 are that, if the sickness and injury rate of male agricultural workers is taken as 100, male transport workers were 103, clerks 104, factory workers 110, and miners 122. The rate for men in families having less than £4 per week from the chief wage earner was 25 per cent greater than in the group with over £5-10-0 per week. Annual days of incapacity of men range from 8 for men in agriculture, clerical and distributive occupations, to 11 for factory workers, and 21 for miners; and from about 10 for the high income group to 21 in the low income group. Annual medical consultations range from 2.6 for agricultural workers to 4 for factory workers and 6.3 for miners.

How did adults react to the new Health Service during its first six months? There was no appreciable change in the frequency with which men consulted doctors; but women under 65 reported an increase around 10 per cent, and older women an increase around 25 per cent in their visits compared with the same period of 1947. At the working ages, men recorded no increase in days of incapacity, but women did; and at ages over 65 women reported having been kept indoors by illness twice as many days as in the second half of 1947. The amount of sickness was not changed, and the provisional conclusion was that women, as a consequence of taking more medical advice took more care of their ailments.

I have tried, in this brief discussion, to show how far we have moved in England in recent years toward the fulfillment of Farr's ideal. It may seem a piecemeal approach, and some of it is experimental, but nothing is to be gained by amassing any more records than are capable of producing the morbidity statistics we really need. Sampling processes are very suitable in parts of this field, though for data requiring a follow-up such as mental diseases and cancer we do not consider them to be practicable. If, after several years' trial, any part of such a program proves to be unproductive it will give place to something else.

The labor involved in collecting morbidity records is large, and the guiding principle must generally be, not whether it would be interesting to have them, but whether they can confidently be expected to furnish knowledge which will repay the labor of their collection. Pooled morbidity statistics from general hospitals are on their trial in this respect and their worth has to be proved during the next few years. That is a problem which the Health Statistics Committee of the World Health Organization is beginning to study; and I hope that we in Britain, America, and Canada will work together on it, profiting by each other's ideas and mistakes.

Simultaneous Immunization of New-Born Infants against Diphtheria, Tetanus, and Pertussis*

Production of Antibodies and Duration of Antibody Levels in an Eastern Metropolitan Area.

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FOR many years it was believed that new-born infants were not capable of adequate antibody response to antigenic stimuli. Experimental data and electrophoretic studies on plasma proteins[1] supported this theory by showing a quantitative and even a qualitative difference between antibodies produced by newly-born animals and more mature members of the same species.

As a consequence, routine immunizations were not started until the latter part of the first year of life or later, leaving infants unprotected at the very age when mortality from whooping cough is highest. Furthermore, with the decline in incidence of diphtheria, an increasing number of mothers have become Schick-positive and therefore unable to transmit to their offspring passive protection against diphtheria in the early months of life.

Prompted by such considerations, an attempt has been made by several investigators to determine the earliest age at which active immunization can be performed with assurance of success. First, Sako[2,3] and then others, expressed the view that very young infants had fully developed the capacity to produce antibodies against pertussis and other antigens.

We were then faced with two conflicting points of view: one, that young infants are poor producers of antibodies; and the other, that age influences the immune response to antigenic stimulation to a limited extent if at all.

The present investigation was undertaken in an attempt to answer the following questions:

1. What antibody response do new-born infants have after injection of known antigens?
2. What is the influence of age on antibody production?
3. What is the earliest age at which routine immunizations can be attempted with assurance of success?

In this study, the material chosen for inoculation was a triple combined vaccine prepared by the Cutter Laboratories called, "Alhydrox." In this material 20 billion *Hemophilus pertussis* organisms per ml. are added to aluminum-hydroxide adsorbed tetanus and diphtheria toxoids.

Others have shown that injecting

* Presented at a Joint Session of the Epidemiology, Health Officers, Laboratory, and Maternal and Child Health Sections of the American Public Health Association at the Seventy-seventh Annual Meeting in New York, N. Y., October 25, 1949.

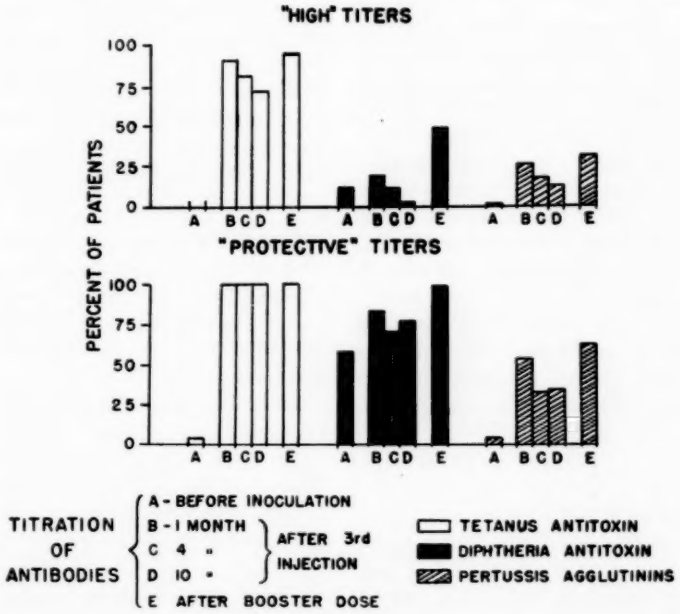
more than one antigen simultaneously is as effective or more effective than their separate administration. A saving of time and a decrease in the number of injections are self-evident practical advantages. It had also been demonstrated that the prolonged antigenic stimulus afforded by alum-precipitated or aluminum-hydroxide adsorbed preparations was necessary for successful immunization in infancy. In the last few years, for convenience sake tetanus toxoid has usually been added to the combination of diphtheria toxoid and pertussis vaccine.

One hundred and ninety-eight full-term infants were studied. Three deep subcutaneous or intramuscular injections of the triple combined vaccine were given at monthly intervals—the first injection of 0.5 ml. at the age of 1 week, the second of 1.0 ml. at 5 weeks, and the third also of 1.0 ml. at 9 weeks of age. By the age of 9 weeks, a total of 2.5 ml. of the vaccine containing 50 billion *H. pertussis* organisms had been administered and basic prophylactic inoculation completed. A booster dose of 0.5 ml. of the same material was administered to some patients at 6 months of age, to others at the age of 1 year.

Blood samples for antibody determination were drawn before, and at various intervals after inoculation. Levels of diphtheria antitoxin were determined by using guinea pigs for the skin tests; tetanus antitoxin levels were performed by standard procedures using mice. Serum pertussis agglutinins were titrated by the Flosdorf method.

The results of antibody titration have been reported in detail elsewhere.[1, 4]

FIGURE 1—Serum Antibody Levels Before and After Administration of Prophylactic Inoculations in the New-born Period



I. PRODUCTION OF ANTIBODIES IN EARLY INFANCY

1. *Serum agglutinins against H. pertussis* (Figure 1, A,B,E,)—Before inoculation, at 1 week of age, 98 per cent of 144 new-born infants tested had no agglutinins against *H. pertussis*. At the age of 13 weeks, 1 month after the administration of the three injections of "Alhydrox," only 30 per cent of 125 patients examined had no pertussis agglutinins; 54.4 per cent had a titer of 1:400 or higher, a titer which according to Miller and Sako[3, 5] affords complete protection against intimate familial exposure to pertussis. Twenty-six per cent of those tested had high agglutinin titers of 1:1,600–1:3,200.

Four to 10 months after basic immunization, when the infants were between the ages of 6 months and 1 year, a booster dose was given. Pertussis agglutinins were titrated again 10–30 days after this booster dose. While the booster failed to elicit a significant change in the number of patients with "protective" or "high" agglutinin titers, it decreased the number of infants showing a complete absence of pertussis agglutinins from 30 per cent to 16 per cent. Antibody determination after a booster injection gives a more accurate picture of the success of immunization. Patients whose antibody-forming tissues are sensitized by the antigen, but who fail to produce circulating antibodies, may do so upon subsequent contact with the antigen.

These figures show that the great majority of new-born infants produce antibodies against *H. pertussis* after prophylactic inoculation. Judging by some of the standards applied in the past, the percentage of infants who showed a "protective" agglutinin titer of 1:400 or higher is rather low. However, Sako[3] showed that a substantial number of patients with low or even with no agglutinin titers after prophylactic inoculation are found to be immune when exposed to pertussis. Final judgment as to the degree of protection achieved in our patients will have to be postponed until more accurate standards of evaluation become available.

2. *Tetanus Antitoxin* (Figure 1)—Before inoculation, 15 per cent of 156 new-born infants tested had appreciable amounts of tetanus antitoxin in the serum. Tetanus antitoxin has heretofore been reported as normally not occurring in the blood of human beings. Our finding can be explained by the fact that, for several years in New York City, most children and adolescents going to summer camp have been immunized against tetanus. Therefore a substantial number of young mothers must have circulating tetanus antitoxin which they transmit through the placenta to their offspring.

At the age of 13 weeks, 1 month after completion of the three inoculations, all of the 128 patients examined had more than the "protective" titer of tetanus antitoxin of 0.1 unit per ml., and 92 per cent of these had very high titers of antitoxin, more than 1.0 unit per ml. of serum. As 1.0 unit per ml. was the top level tested for, no great change in titers could be expected after booster dose. These results are obviously highly satisfactory.

3. *Diphtheria antitoxin* (Figure 1)—A level of 0.03 units of antitoxin per ml. of serum was considered as affording complete protection against diphtheria. Titrations were not carried out below this level.

Of 168 infants tested 7 days after birth, 58.5 per cent were found to have "protective" titers of antitoxin. Twelve per cent of the total had antitoxin levels of more than 1.0 unit per ml. This antitoxin was obviously transmitted by their mothers to the infants through the placenta. The crowded housing condi-

tions and the low economic status of the families involved may explain this relatively great number of mothers capable of transmitting passive antibodies.

One month after the third injection 84.6 per cent of 123 infants tested had a "protective" titer of diphtheria antitoxin, only 20 per cent had antitoxin levels of more than 1.0 unit per ml., and 15 per cent had less than the minimum antitoxin titer tested for. After booster dose, however, with one exception, all patients developed "protective" antitoxin titers and the percentage of those with high antibody levels had risen from 20 per cent to 50 per cent.

The fact that all patients except one had protective titers after booster dose indicates that active immunization was achieved despite the passively transmitted antitoxin present at birth in over half the cases. Even in the patients who failed to produce serum antibodies after the three basic immunizing injections the immune mechanisms had apparently been adequately "sensitized." It must be assumed that while part of the injected diphtheria toxoid was neutralized by circulating antitoxin, enough antigen reached the tissues to produce satisfactory immunization.

II. DURATION OF ANTIBODY TITERS

Levels of tetanus and diphtheria antitoxin and of serum pertussis agglutinins were determined one month, four months and ten months after the third immunizing injection, at the ages of 13 weeks, 6 months, and 1 year (Figure 1 B, C, D), making a total follow-up period of nine months after completion of the basic immunizing injections.

1. *Duration of tetanus antitoxin titers*—Throughout this period of 9 months all patients examined had "protective" titers of tetanus antitoxin. The percentage of cases with high antitoxin levels (more than 1.0 unit per ml.) decreased progressively from 92 per cent one month after completion of inoculations, to 73 per cent at the end of the first year.

2. *Duration of diphtheria antitoxin titers*—During the period of observation there was only a slight drop in the percentage of infants with "protective" levels of diphtheria antitoxin, from 84 per cent at 13 weeks of age to 77 per cent at the age of 1 year. There was a steady decline, however, in the number of cases with high (more than 1.0 unit per ml.) antitoxin levels.

3. *Duration of serum pertussis agglutinins*—There was a decline in the 9 month period of almost 50 per cent in the number of patients with serum agglutinin titers against *H. pertussis* of 1:400 or higher ("protective" titers), but no further change in the next few months. As in the case of tetanus and diphtheria antitoxin, there was a steady decrease in the proportion of patients with "high" agglutinin titers (1:1,600-1:3,200).

4. *Comment*—It has been shown that high antitoxin titers are lost more rapidly than lower ones, a finding confirmed by our cases. It is also known that a progressive decline in the lower tetanus and diphtheria antitoxin levels takes place[4]; but this could not be shown because of the short follow-up period. However, it is important to emphasize that, during the 9 months following inoculation, all of the patients followed maintained levels of tetanus antitoxin considered to be "protective." This reëmphasizes the satisfactory immunization achieved against tetanus because in pediatrics prophylactic inoculation against tetanus should assure continued complete protection.[6]

The decrease in pertussis agglutinin titers had not been observed by other investigators. Indeed it has been stated by various authors that after immunization, levels of pertussis agglutinins per-

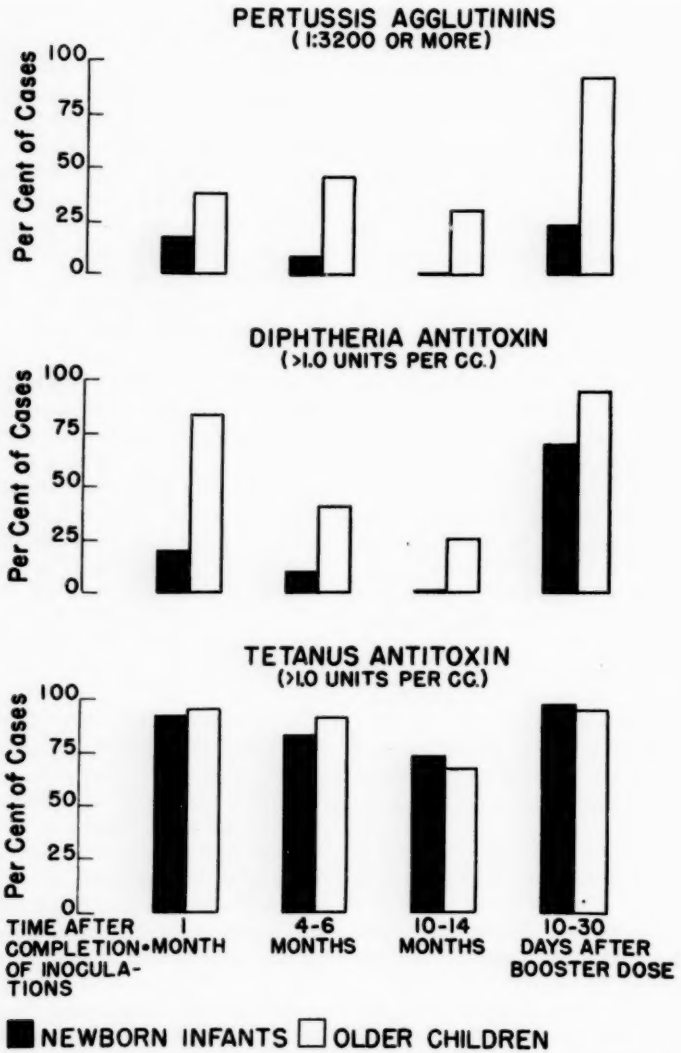


FIGURE 2—Comparison of "High" Antibody Titers Achieved After Prophylactic Inoculation by New-born Infants and "Older" Children
From *Pediatrics*, 1949.

sist essentially unchanged for 2 to 6 years.[4] Perhaps the young age of the patients in our series and the total dose of pertussis vaccine, less than recommended by some authors, may explain these findings.

III. INFLUENCE OF AGE ON ANTIBODY PRODUCTION

Further studies were undertaken to gauge the influence of age on antibody production. A comparison was made of the results of prophylactic inoculation in

the series of new-born infants under consideration with a group of older children.[7, 8] In all instances the same triple combined vaccine, "Alhydrox," was used and following the same routine. The only difference was in the age at which the injections were begun. While inoculations were started at 1 week of age in the new-born group, the older children were 6 months or more at the time of first injection.

The results of the comparison are summarized in Figure 2. The group of new-born infants is assigned the filled-in blocks, and the older children the outlined ones. Only the "high" antibody titers are considered.

The patients in the older age group consistently showed higher pertussis agglutinin titers than the new-born infants. When analyzed with the chi square test the differences in all instances were found to be statistically significant. As passive immunity to pertussis was not present at birth, and therefore could not interfere with active immunization, the poorer antibody response of new-born infants as compared with older children must be attributed solely to immaturity of the immune mechanisms.

Tetanus antitoxin production after inoculation was equally good in both age groups. This was presumably due to the fact that the tetanus toxoid used was of great antigenic capacity. From previous studies Alhydrox is known to have tetanus toxoid of great potency. One can assume that if a sufficiently great antigenic stimulus is given, the handicap due to immune mechanism immaturity may be overcome and satisfactory immunization achieved.

In the case of diphtheria, it was found that older children consistently had higher antitoxin titers after injection than new-born infants, but after booster dose the difference between the two groups was not great enough to be significant statistically. Therefore the final degree of immunization was roughly comparable in both age groups. The relatively poor initial showing of the new-born infants may be attributed at least partly to the presence of trans-placentally transmitted passive diphtheria antitoxin. Here again, the antigenic stimulus of 75 L_f of diphtheria toxoid was potent enough to overcome the combined handicaps of tissue immaturity and existing passive immunity to diphtheria.

IV. CONCLUSIONS

It must be concluded that in the first months of life, antibody response to an antigenic stimulus increases with advancing age. This confirms in human beings the experimental evidence obtained by others in animals. We cannot agree with those who state that age makes no difference in the immune response to prophylactic inoculation. Another more cautious conclusion is that while the results of immunization in the very young infant may not be as good as in the older child, a significant degree of protection may be obtained by starting prophylactic injections in the new-born period. However, because of the combined handicaps of immaturity of the immune mechanisms and interference of the passive immunity to diphtheria with active immunization, it is felt that further evaluation of the degree of clinical protection afforded the individual is necessary before immunization in the new-born period is advocated as a routine procedure. It is suggested that, in the meantime, triple combined inoculation against tetanus, diphtheria, and pertussis be postponed to the age of 3 months. Thus, the critical period of immune mechanism immaturity will have been passed and immunity achieved several months earlier than by following conventional schedules.

V. SUMMARY

This investigation was undertaken in an effort to determine how soon after birth routine immunizations could be

performed with assurance of success.

The capacity of young infants to produce antibodies was ascertained by giving three injections at monthly intervals of a triple combined vaccine against diphtheria, tetanus, and pertussis. The first inoculation was given at 1 week of age. Serum antibody levels were then determined before and at various intervals after injection.

It was found that all of the 198 infants studied produced antibodies against diphtheria and tetanus and the great majority against pertussis.

The antibody levels obtained in newborn infants were then compared with those of older children who had been inoculated with the same immunizing material and following the identical schedule.

It was concluded that during the first year of life the capacity to produce antibodies in response to an antigenic stimulus increases with advancing age. It was felt, however, that in some instances the immunologic handicap due to tissue immaturity can be overcome if a sufficiently potent antigenic stimulus is given.

A conservative approach to the problem of active immunization in early infancy is urged. It is suggested that until further work is done, routine prophylactic inoculations not be started before the age of 3 months.

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National Science Foundation Bill Approved

President Truman on May 10 signed a bill creating the National Science Foundation which is designed to promote basic research and education in the sciences, including physical, biological, and engineering phases, as well as the granting of scholarships and fellowships in scientific study (*American Journal of Public Health* Editorial May, 1950, p. 606).

Simultaneous Immunization of Young Children against Diphtheria, Tetanus, and Pertussis*

Experience in a Northern Metropolitan Area

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THE chief reason for early immunization of infants is to confer protection against pertussis; neither diphtheria nor tetanus is a health problem during the early months of life. Approximately one-half of all pertussis deaths occur before the 7th month. Reduction of these deaths to a minimum requires the administration of potent pertussis vaccine in sufficient dosage, as early in life as adequate and durable basic immunity can be conferred. Prophylactic use of pertussis vaccine earlier than the 6th month is desirable, especially for many infants in cities and institutions. If, in addition, it is possible to confer simultaneously adequate and durable basic immunity against diphtheria and tetanus, it will not only be a great time saver for all concerned, but will reduce discomfort and reactions to a minimum. It is important, however, that multiple antigens cause no untoward reactions; nor when mixed, should one constituent lessen the antigenic potency of the others. Most cases of tetanus encountered in pediatric practice occur from insignificant wounds. There is no natural immunity. A multiple antigen containing tetanus toxoid confers protection to many children who would not otherwise receive it. For sustained protection after basic immunization against diphtheria, tetanus and pertussis stimulating doses are necessary from time to time.

Most attempts at early immunization of infants have met with difficulties of one kind or another. Little or no immunity was found by Sauer [1] when 3 weekly doses of potent pertussis vaccine were administered during the first months of life. Cohen and Scadron [2] injected pertussis vaccine into expectant mothers, and found pertussis antibodies in the infants' blood which conferred passive immunity. Sako, Treuting, Witt, and Nichamin [3] administered 3 monthly doses of an alum-precipitated pertussis vaccine, starting during the first months of life. On the basis of agglutination tests and epidemiological data, a relatively high percentage developed immunity. There were no pertussis deaths among those who developed the disease subsequently. Bell [4] gave 2 monthly doses of an alum-precipitated mixture of diphtheria toxoid with pertussis vaccine to two groups aged 2 to 4 months and 5 to 23 months respectively. He did not find any difference in the degree of clinical protection in the two groups.

* Presented at a Joint Session of the Epidemiology, Health Officers, Laboratory, and Maternal and Child Health Sections of the American Public Health Association at the Seventy-seventh Annual Meeting in New York, N. Y., October 25, 1949.

Sauer, Tucker, and Markley[5] found an alum-precipitated mixture of diphtheria toxoid with a total dose of 30,000 million pertussis bacilli to yield a higher percentage of adequate immunity than did a fluid mixture with a total dose of 90,000 million bacilli. Cooke, Holowach, Atkins, and Powers[6] reported that 2 doses of an alum-precipitated mixture of diphtheria and tetanus toxoids were inadequate for diphtheria protection when administered during the first months of life. di Sant' Agnese[7-10] administered 3 monthly doses of an alum-precipitated mixture of diphtheria and tetanus toxoids with pertussis vaccine to two groups of infants. To one group, the first dose was administered at the age of 1 week, to the other group at 6 or more months. The younger group produced significantly lower diphtheria antitoxin titers; after a stimulating dose, the diphtheria antibody production in the two groups was comparable. Although the tetanus antitoxin levels in the two groups was about the same, it declined more rapidly in the new-born group. Pertussis agglutinin levels were consistently lower in the new-born group (54 per cent 1 month after the final dose as compared to 86 per cent in the older group). When repeated 3 months after the final dose, it was 33 per cent in the new-born and 82 per cent in the older group. A difference persisted after a stimulating dose administered 1 year after the final dose of the basic immunization. Volk[11] found that 3 monthly doses of an alum-precipitated multiple antigen preparation produced very good results in children between 2 and 5 years of age. The value of early immunization is still an unsolved problem and further investigations seemed advisable.

PROCEDURE

In a paper read by us at the 1946 Meeting of this Association, it was pointed out that when the customary 3 doses of an alum-precipitated mixture of diphtheria toxoid and pertussis vaccine were administered during the first months of life, adequate pertussis immunity did not result. We began this study by the administration of 3 monthly doses of an alum-precipitated mixture of diphtheria toxoid and pertussis vaccine to a small group of infants starting at the 4th month of life. Schick tests, diphtheria antitoxin determinations, and pertussis complement-fixation tests were performed 3 months after the final dose. The data showed that protection against diphtheria occurred in 97 per cent, but only 65 per cent of the infants showed adequate protection against pertussis (Table 1). These findings led us to administer 4 monthly doses of an alum-precipitated mixture of diphtheria and tetanus toxoids with pertussis vaccine to a group of infants starting at the age of 3 months.

TABLE 1

Results of Tests for Immunity Following Three Doses of Alum-Precipitated Diphtheria Toxoid and Pertussis Vaccine (At 4, 5, and 6 Months)

	Diphtheria		*Pertussis*
No. of Infants	*Schick-negative*	*Antitoxin 0.2 unit or more*	*Compl.-Fixation 3 or 4+*
57	100%	97%	65%

This report deals with the results of administration of an alum-precipitated mixture of diphtheria and tetanus toxoids with pertussis vaccine to two groups of infants. Group I consisted of infants 6 or more months of age who received 3 monthly doses of 0.5 ml. of the antigenic mixture. Group II were infants who received 4 monthly doses of 0.5 ml. at 3, 4, 5, and 6 months of age. Tests for immunity were performed 3 months after the final dose of multiple antigens.

MATERIALS

The alum-precipitated mixture of

diphtheria and tetanus toxoids with pertussis vaccine used in Groups I and II was a combination of refined diphtheria and tetanus toxoids and Phase I pertussis vaccine. It was standardized to contain in each ml. of antigen twice the necessary amounts of diphtheria and tetanus toxoids and 30,000 million *H. pertussis*, so that amounts could be administered in doses of 0.5 ml. each. The alum-precipitated mixture of diphtheria toxoid and pertussis vaccine used in Table 1 was a mixture of standard alum-precipitated diphtheria toxoid and Phase I pertussis vaccine. The final volume of the product was standardized to contain twice the necessary amount of diphtheria toxoid and 30,000 million pertussis bacilli per ml. Both antigen preparations met the minimum requirements established by the National Institute of Health.

TECHNIC

Twenty-five gauge, 10 to 15 mm. needles were used. Each dose of 0.5 ml. was administered deeply into alternate gluteal areas, starting with the left proximal region. To rid the needle tract of alum particles, each dose was terminated with 0.1 ml. of air. As soon as the needle was withdrawn, the site was massaged gently and briefly with sterile gauze to prevent oozing, and to distribute the alum-precipitated antigen into the deeper tissues.

REACTIONS

At the time of the first dose the parent was instructed to avoid excessive bed covering, to offer plenty of drinking water, to reduce the amount of food at the following meal, and to give one grain of aspirin one or more times daily if fever occurred. Systemic reactions were transient; occasionally the rectal temperature reached 39° C. within 4 to 12 hours after injection. It was not necessary to subdivide or delay a dose on account of severity of systemic or local reaction. The preparation was not administered during an acute infection, in prematurely-born infants, in instances where the physical condition made it inadvisable, or in any child with a tendency to convulsions (such as spastics). In no instance * did a child develop convulsions or show any signs of encephalopathy as reported by Byers and Moll[12] and Toomey.[13] In some infants a residual nodule could be palpated at the time of the subsequent dose. A fluctuating or discharging alum cyst was rarely encountered—approximately once in 800 doses.

Injection of Lateral Gluteal Area

TESTS FOR IMMUNITY

Preliminary immunity tests were not performed before the administration of these alum-precipitated antigens because in previous studies we had found, on the basis of immunity tests, that few infants at the age of 3 or 4 months possessed immunity to tetanus, diphtheria, and pertussis. Passive diphtheria immunity transmitted from the mother was usually absent.

Laboratory tests and skin (Schick) tests were used as evidence of antigen-conferred immunity because clinical diphtheria, tetanus, and pertussis have

* Pertussis vaccine (fluid and alum-precipitated) and multiple antigens (fluid and alum-precipitated) have been administered by one of us (L.W.S.) since 1925 to more than 15,000 infants and children without causing untoward reaction.

been very infrequent since 1940, both in Evanston and at St. Vincent's Infant and Maternity Hospital where part of this work was performed. No private patient injected with this multiple antigen prepared during the past five years is known to have contracted any of these diseases. The tests were made approximately 3 months after the final dose of multiple antigens. In Group I, a negative Schick test served as evidence for immunity to diphtheria. For tetanus, an antitoxin level of 0.1 unit or more per ml. of blood was considered evidence of adequate immunity. For pertussis, a complement-fixation reaction of 3 or 4+ was considered evidence of adequate immunity. For Group II, a negative Schick test and a diphtheria antitoxin level of 0.2 unit or more per ml. of blood were considered evidence of adequate immunity. The test for tetanus immunity was the same as that carried out in Group I. For pertussis, the rapid agglutination test of Daughtry-Denmark [12] was used. An agglutination reaction of 3 or 4+ was considered evidence of adequate immunity. This equals a titer 1:320 or more. Sako [3] and associates had found it satisfactory when compared with the more time-consuming tube agglutination test of Miller and Silverberg.[16] Lapin [13] described this rapid agglutination method in detail in his book *Whooping Cough*. We employed the test because we too had found good correlation between it and a tube agglutination method, and the more time-consuming complement-fixation reaction. When the result of a test indicated inadequate protection, a stimulating dose of 0.5 ml. of the antigen was administered; when the child was retested a month later, the immunity response was usually found to be adequate.

RESULTS

GROUP I — Approximately 3 months after the final dose, follow-up tests for immunity were performed on 98 of the children, to whom 3 monthly doses of 0.5 ml. of the alum-precipitated mixture of diphtheria and tetanus toxoids with pertussis vaccine had been administered after the 6th month of life. The Schick test was found negative in 100 per cent; a tetanus antitoxin level of 0.1 unit or more per ml. of blood was found in 96 per cent; and the pertussis complement-fixation reaction was 3 or 4+ in 83 per cent (Table 2). Infants whose tests indicated inadequate protection were given an extra (fourth) dose of 0.5 ml. of the alum-precipitated mixture in the right distal gluteal area. A month later the pertussis immunity had risen to an adequate level in each of the retested children.

TABLE 2

Results of Tests for Immunity Following Three Doses of Alum-Precipitated Multiple Antigens (After 6 Months of Age)

	Diphtheria	Tetanus	Pertussis
No. of Infants	Schick-negative	Antitoxin 0.1 unit or more	Compl.-Fixation 3 or 4+
98	100%	96%	83%

GROUP II — Tests for immunity approximately 3 months following injections were performed on 163 children to whom 4 doses of 0.5 ml. of the alum-precipitated mixture of diphtheria and tetanus toxoids with pertussis vaccine were administered at 3, 4, 5, and 6 months. The Schick test was found negative in 100 per cent; a diphtheria antitoxin level of 0.2 unit or more per ml. of blood was found in 96 per cent; a tetanus antitoxin level of 0.1 unit per ml. of blood was found in 100 per cent;

TABLE 3

Results of Tests for Immunity Following Four Doses of Multiple Antigens (At 3, 4, 5 and 6 Months)

	Diphtheria	Tetanus		Pertussis
No. of Infants	Schick-negative	Antitoxin 0.2 unit or more	Antitoxin 0.1 unit or more	Agglutination
163	100%	86%	100%	98%

and the pertussis agglutination test showed adequate protection in 98 per cent (Table 3).

SUMMARY

1. From the evidence presented it appears that alternate lateral gluteal areas are the most favorable sites for the intramuscular administration of alum-precipitated multiple antigen preparations.

2. Three monthly doses of an alum-precipitated mixture of diphtheria toxoid and pertussis vaccine administered at 4, 5, and 6 months conferred adequate protection against diphtheria to 97 per cent, but in only 65 per cent against pertussis.

3. An alum-precipitated mixture of diphtheria and tetanus toxoids with pertussis vaccine administered to infants in 3 monthly doses after the age of 6 months conferred immunity against diphtheria in 100 per cent, against tetanus in 96 per cent, and against pertussis in 83 per cent.

4. An alum-precipitated mixture of diphtheria and tetanus toxoids with pertussis vaccine administered to infants in 4 monthly doses at the age of 3, 4, 5, and 6 months conferred protection against diphtheria to 86 per cent, to tetanus in 100 per cent, and to pertusis in 98 per cent.

NOTE: The authors are indebted to the Research and Biological Laboratories of Parke, Davis and Company (Detroit, Mich.) for supplying the alum-precipitated antigens used in this study and for performing the diphtheria and tetanus antitoxin determinations.

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Simultaneous Immunization against Diphtheria, Tetanus, and Pertussis*

Problems Inherent in the Production of a Good Multiple Antigen

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A "GOOD" multiple antigen could be taken to mean an antigen which produces a better than average antibody response in the subject, providing a high grade of protection, and one which is at the same time safe in use and free from undesirable side reactions. The definition would, however, be rather meaningless if it did not also give some quantitative idea of the potency of each of the component antigens. We prefer to regard a good multiple antigen as one which comfortably exceeds the Minimum Requirements of the National Institutes of Health for this type of product, insuring the user a preparation which is reasonably uniform from lot to lot. The words "Minimum Requirements" or "Requirements" used in this paper refer to those issued by the National Institutes of Health.

There is now a great deal of evidence, some of which has been presented here today, that immunization with combined diphtheria, tetanus, and pertussis antigens may be carried out safely and effectively. The advantages of combined antigens, particularly in children, are now apparent and their use will be limited only by such considerations as the severity of the reactions which they tend to produce, by the necessity for immunizing the patient against one particular agent, or for providing individual booster or recall doses. A number of preparations are available or have been tried experimentally, including plain toxoids, alum-precipitated or adsorbed toxoids, together with fluid pertussis vaccine or alum-precipitated vaccine. In addition, there are aluminum-hydroxide-precipitated materials, protamine-precipitated toxoids, aluminum-phosphate-precipitated toxoids, and a number of others. The physician is provided with a choice of immunizing agents which must at times seem bewildering. Furthermore, during the past few years there have been offered a number of purified toxoid preparations made by a number of different methods and, if past experience is any guide, the end is not yet in sight. Each of these preparations and methods of purification may have its own individual recommendations and while there are differences it would be difficult, in the broad sense, to select one type in preference to another designed for a similar purpose. We shall confine ourselves to a consideration of the factors which must be taken into account in the preparation of a multiple antigen which will satisfactorily pass requirements for potency and safety and at the same time make for acceptability in use by both physician and patient.

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POTENCY

The tests performed on multiple antigens are exactly the same as those required on the individual products. Provision is made in the Minimum Requirements for the performance of the test on the separate antigens either before mixing, where it can be shown that mixing has no deleterious effect upon the antigenic potency of the individual components, or when it is feasible, and this is the more desirable procedure, on the final product, each component being assayed separately. It should be noted that potency tests for the diphtheria and tetanus components, plain and alum-precipitated, are based upon the recommended total human immunizing dose. There is agreement that toxoids passing such tests satisfactorily provide an acceptable level of immunity. In the case of the pertussis component, however, there is as yet no general concurrence as to how the potency test in mice is to be interpreted in terms of the protective human dose. The test merely shows that the pertussis antigen is equal or superior to a reference standard vaccine, organism for organism. The actual number of organisms of a vaccine of satisfactory potency incorporated in the final product is based on experience and may in fact prove arbitrary. Further study of this question is desirable.

Potency tests have always been required for the diphtheria and tetanus components and requirements have been increased in stringency in the case of diphtheria as producers demonstrated their ability to exceed them; and the provision of a higher level of antigenicity seemed indicated. Tests for the pertussis component were first required in January, 1949. It is perhaps too soon to talk of increasing these potency requirements yet but if there is a demand for this, and if producers demonstrate their ability consistently to produce vaccines of higher potency, this will eventually be considered.

When multiple antigens were first used, there was considerable feeling, based largely upon the theory of competition of antigens, that combined products would be less antigenic than the separate components, and that one immunization should be completed at a time. However, the fallacy of this assumption has been amply demonstrated, and there is now abundant evidence that mixtures of toxoids containing pertussis vaccine produce a higher antigenic response, for the toxoid components at least, than the agents used separately both in animals and in human subjects. Enhancement is not noted to the same extent when two toxoids such as diphtheria and tetanus are given together in the absence of pertussis vaccine. The actual reasons for this phenomenon are not entirely clear. It may be that the presence of foreign protein introduced with the killed pertussis organisms has an adjuvant effect similar to the well known potentiation which has been noted for many years and has found practical application in antitoxin production where such materials as tapioca, oil or in fact components of the medium used for producing toxin, enhance the antigenic effect of toxoids. It might be argued that in the face of this phenomenon, producers of multiple antigens should be required to perform potency tests prior to mixing the components so that the patient might obtain the benefit of any such potentiating action and would not be deprived of the necessary protection in case the enhancement should not take place even though animal assay showed satisfactory potency for the combined antigens. However, as indicated above, the latter is the more acceptable. This is mainly because it is desirable to have all potency tests performed on the final product where feasible, as an additional check against the possibility of errors in processing.

The dose volume to be used for immunization with a multiple antigen is

an important consideration. In cases where plain toxoids enter into the mixture, the resulting product represents an actual dilution of each of the components and if the dose of these is large in the first place, it may be necessary to recommend quite a large volume of the triple antigen to be administered, in order that the patient be provided with a sufficient amount of antigen as indicated by the potency tests. This is not such a serious problem with alum-precipitated material, since the acceptable immunizing doses are usually of smaller volume and the antigen can be concentrated in the process of precipitation. Problems of this type are now largely resolved because presently used methods of production permit the preparation of antigens of high initial potency and the concentration and purification of toxoids. It is thus possible to prepare a product of satisfactory potency and acceptable dose volume. Dilution of individual toxoids was formerly regarded with suspicion even though the parent material showed high potency. Regulations are now interpreted as permitting this procedure, in order to provide a working basis for the use of potent or purified toxoids particularly in multiple antigen mixtures providing that potency tests prove to be satisfactory at the proposed dilution.

SAFETY AND INNOCUITY

The Minimum Requirements call for a safety test on the final product and for toxicity tests at different stages of production. A distinction must, however, be made between "safety tests" which are designed to protect the patient in the event of unusual toxicity of the product itself, and tests designed to reveal the possibility of undesirable reactions which sometimes follow administration, due to idiosyncrasy, sensitivity, or unusual susceptibility of the patient. Safety tests, as described in the Minimum Requirements, while providing assurance that the patient will not receive a harmful preparation, cannot be used to predict whether a particular product will be well tolerated clinically. In the case of pertussis vaccine, which is probably responsible for a higher incidence of reactions than the toxoid components, a so-called toxicity test is applied in addition to the regular safety test. Application of this test indicates that while most pertussis vaccines show a fair degree of toxicity soon after production, this falls off with aging either in the icebox or at a higher temperature. It is desirable to have an aged vaccine in order to insure the minimum of reactions due to pertussis toxicity. Some causes of reactions encountered with toxoids are (a) excessive amount of formaldehyde, (b) presence of allergenic substances, (c) presence of products of bacterial growth, (d) use of unusually large amounts of alum, (e) volume of individual dose. The first three are rigidly controlled by regulations. Formaldehyde content must be less than 0.02 per cent; allergenic substances such as certain peptones and animal bloods likely to cause sensitization must not be used in the preparation of media. The alum content of the final product must be less than 20 mg. per dose. It is now possible, with comparative ease, to provide toxoids satisfying these requirements.

The presence of alum in a multiple antigen even in permissible amounts may give rise to nodule formation and in some cases to sterile abscesses or cysts. This tendency seems to be increased by the presence of pertussis vaccine. In those preparations containing a relatively high amount of nonspecific protein, where a large amount of alum, i.e., up to 20 mg. per individual dose, has to be used in order to produce a product of acceptable potency, this is a real problem. By using materials of high potency, with which the alum may be considerably reduced without sacri-

fice of antigenic potency, this problem loses much of its seriousness.

In order to be acceptable to the physician and the patient, the dose volume should be such that little or no discomfort is caused to the patient on the basis of size of dose alone. It is sometimes difficult to prepare a combined product which will pass the required potency tests at less than 2 ml. individual dose when crude or fluid toxoids are used. It is here that purified toxoids will probably show their greatest usefulness, for by purification and concentration it is possible to design a mixture so that individual doses of a more acceptable size (for instance 0.5 ml.) carry the necessary amount of antigen as determined by standard potency tests.

Serious reactions may be produced by the presence of substances derived from constituents of the media used or from the metabolic or other processes occurring during the growth of the organisms used in toxin production. This is of course most serious in the case of the diphtheria component, particularly in reimmunization or in the immunization of older children or adults. Much has been done to improve the production media with a view to obtaining materials of high potency and minimal reactivity. Synthetic media are being successfully used. Purification offers a method of reducing the amount of deleterious substances present in a toxoid. Although strides have been made in the techniques and degree of purification in recent years and it is now possible to obtain antigens of very high purity in terms of specific immunizing proteins, the goal of absolute purity is still some way off, so far as large-scale production of toxoids is concerned. The residual protein fraction, even when present in minute amounts, may still cause reactions in sensitive individuals. It is not reasonable to expect absolute freedom from reactions even with products of the highest purity, since it has been demonstrated in the case of diphtheria that subjects receiving pure toxoid may be sensitized to the toxoid fraction as demonstrated by a pseudo-Schick reaction.

Complaints are sometimes received that use of a particular lot of an immunizing agent has resulted in an unusual number of severe reactions. These may be objective, with observable local and general symptoms, or purely subjective on the part of the patient. In either case it is rarely possible to demonstrate any abnormality by animal tests used at present. The development of a workable method for assessing combined antigens, or other biologics for that matter, for undesirable qualities of this nature would be welcome.

PURIFIED TOXOIDS

Mention has been made above of the use of purified toxoids in the preparation of combined antigens. The manufacture and general use of these antigens is relatively new and their introduction has created considerable interest. It might be well to mention briefly some of their more important features and advantages.

a. Purification permits concentration of the antigen, allowing considerable freedom in the preparation of a properly balanced multiple antigen. This is possibly the most important advantage.

b. Reactive substances other than the specific immunizing agent can be reduced in amount. At the present time it does not seem as though it will be possible to remove them completely in an economical manner. Purification cannot of course eliminate that type of reaction which is caused by sensitization to the toxoid protein itself.

c. Purification removes free formaldehyde. This is an obvious advantage, even though the maximum allowable level is low according to present requirements.

d. It is possible to decrease the amount of alum or other mineral carriers used in multiple antigens to the point where it does not produce serious cyst formation thus eliminating, or at least reducing, one serious cause of sterile abscess formation.

SUMMARY

Simultaneous immunization with diphtheria, tetanus, and pertussis antigens is feasible. Improvement in the production of media testing and in the manufacture of purified toxoids permit of the preparation of combined antigens of good immunizing power, acceptable dose volume, and relative freedom from untoward reactions. Absolute freedom from reactions may not be possible because of the relative toxicity of pertussis vaccine as compared with toxoids and the possibility of sensitization to individual toxoids. Further improvement may be achieved in an increase in the antigenicity of pertussis vaccine, reduction of its toxicity, and in removing some of the nonspecific proteins remaining in purified toxoids, while overall antigenicity may be increased by modifications of the mineral carriers or adjuvants used in precipitated preparations.

Occupational Disease Reporting

Reliable statistics on occupational diseases for the country as a whole are virtually nonexistent. The need for them has long been recognized by industrial hygienists, insurance carriers, medical directors of private industries, trade associations, and many others. A 2 year experiment to determine the feasibility of instituting a national system for uniform collection of reports of occupational diseases will be started in May by 10 eastern states with the Division of Industrial Hygiene of the Public Health Service. The states have agreed to use standard forms supplied by the Service and to forward them for tabulation and analysis for the 2 year period. To facilitate the coöperation of practising industrial and private physicians with the states in the study, the Service has prepared a booklet explaining the background and purposes of the pilot study and giving instructions for the use of the printed forms.

The participating states are Connecticut, Florida, Georgia, Indiana, Michigan, New Hampshire, New York, South Carolina, Tennessee, and Wisconsin. At present they have widely varying systems of occupational disease reporting.

A Study of the Chemical and Clinical Qualities of Serum Albumin and Serum Gamma Globulin Prepared from Human Blood More Than Twenty-one Days Old*

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A STUDY of the qualities of serum albumin and serum γ-globulin prepared by the method of Cohn, *et al.*[1] from human blood stored for at least 21 days at +5° C. has never been made on a large scale. The minimum requirements of the National Institutes of Health and the Commission on Plasma Fractionation specify that albumin shall be prepared from plasma within 72 hours of blood donation if it is to be used clinically. It has become increasingly clear since the beginning of the Massachusetts Blood Program late in 1945 that blood bank operations would be much more economical if salvage of albumin and γ-globulin from plasma of outdated blood were possible.[2-5]

Usually a small percentage of the blood drawn in hospitals and in the present Red Cross National Blood Program is not used within 21 days because the need for blood of any specific blood group varies from time to time. It occurred to us that the plasma pooled from such material could be an excellent source of both albumin and γ-globulin. If this were true, blood should never have to be discarded when it outdates. Therefore, a study has been carried out to demonstrate that both proteins, when obtained from blood older than 21 days and processed for distribution to the clinician, meet the minimum requirements of the National Institutes of Health and the Commission on Plasma Fractionation. Some 2,300 liters of plasma from outdated blood have been studied. We have obtained approximately 2,800 units (100 ml. of 25 per cent solution) of albumin and 36,800 units (2 ml. of 16.5 per cent solution) of γ-globulin for distribution from this study.

EXPERIMENTAL

The procedure employed at the Division of Biologic Laboratories for the past two years is as follows:

A volume of 475 ml. of blood from normal donors is drawn into bottles containing 75 ml. of an anticoagulant mixture (ACD) containing 1.45 gm. of

* This paper is Number 85 in the series of "Studies on Plasma Proteins" from the Harvard Medical School, Boston, Mass., on products developed by the Department of Physical Chemistry from blood collected from voluntary donors.

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sodium citrate ($Na_3C_6H_5O_7.5\frac{1}{2}H_2O$), 0.55 gm. of citric acid ($H_3C_6H_5O_7.1H_2O$), and 1.65 gm. of dextrose. The buffered citrate solution has a pH of 5.00 and permits storage of whole blood for at least 21 days at +5° C. without appreciable hemolysis. Immediately following donation, each bottle of blood is chilled to +5° C. in a water ice bath and held at this temperature in insulated cases for the remainder of the day until it is transferred to the laboratory. At the laboratory, it is stored in the +5° C. cold room. After the Hinton test, blood group and Rh type are determined, the blood is released to hospitals by regular weekly shipments and there it is stored at the proper temperature until used. Usually, 10 to 20 per cent of the blood that is satisfactory for whole blood transfusion is not used within 21 days and is returned to the laboratory and stored at +5° C. until the plasma is pooled. Once a week a pool is made and stored at —15° C. to —25° C. until a volume convenient for fractionation is obtained. In some cases plasma has been stored for a year before fractionation was started. Pyrogen tests are not done on either the blood or plasma before fractionation.

ALBUMIN

For the separation of albumin, Method 6 of Cohn, *et al.*[1] was used and for the separation of γ-globulin from Fraction II+III obtained by Method 6, Method 9 of Oncley, *et al.*[6] was used. In the present study, the dried albumin was reconstituted at pH levels between 6.3 and 6.8 as a 25 per cent protein solution low in salt and containing 0.04 M sodium-acetyl-dl-tryptophane, an excellent stabilizer for albumin.[7] Sodium bicarbonate was used in all pH adjustments. Following reconstitution, the albumin was sterilized by filtration through Hormann D10 sterilizing pads. Samples of the bulk solution were taken for sterility and rabbit pyrogen tests. When the material was proved free of contamination and had passed the thermal test in rabbits, it was dispensed into final containers and heated at 60° C. for ten hours.[7] Following this treatment each final container was stored for one week at room temperature and one week at 37° C. and a final container sterility test was made. During the period of sterility testing, flame photometer measurements for sodium, electrophoretic analyses, and thermal stability tests were made. A final container rabbit pyrogen test as well as guinea pig and mouse safety tests as required by the National Institutes of Health were also carried out. When all the laboratory tests showed that the material was satisfactory, it was furnished to a coöperating clinician for human safety tests.

The albumin control tests required by both the National Institutes of Health and the Commission on Plasma Fractionation are summarized in Table 1. The results with seven preparations obtained from the plasma of outdated blood (HAB 6,7,8,9,11,14,31), and one preparation obtained from plasma fractionated within 72 hours of blood donation (HAB 10), are recorded.

In all preparations the sodium level falls below the Commission on Plasma Fractionation specification of "not greater than 0.33 gm. per 100 ml. of solution." The electrophoretic purity of each is greater than the minimum level of 97 per cent required by the organizations mentioned above.

All preparations met the thermal stability requirements of both the National Institutes of Health and the Commission on Plasma Fractionation. Stability was measured by the length of time necessary for a preparation to increase 20 nephelometric units when exposed both to 50° C. and 57° C. and when measured in a Mueller nephelometer.[7,8] An albumin preparation is passed for distribution if it does not have an initial reading greater than 15 neph-

TABLE 1

*Chemical and Clinical Qualities of Albumin**

Preparation	Volume Final 25 per cent solution	pH	Sodium Content	Albumin Purity	Initial Reading	Increase 12 days at 50° C.	Increase 50 hrs. at 57° C.	Safety Tests Animal	Safety Tests Human
	liters		g/100 ml.	%	NU	NU	NU		
Albumin Prepared from Plasma Fractionated over 21 Days after Blood Donation									
HAB 6	8	6.8	0.31	98.5	7	2	2	satisfactory	satisfactory
HAB 7	27	6.7	0.30	98.5	9	0	2	"	"
HAB 8	37	6.7	0.31	100.0	9	−1	2	"	"
HAB 9	61	6.6	0.25	97.5	9	4	8	"	"
HAB 11	47	6.3	0.29	97.5	9	1	13	"	"
HAB 14	30	6.5	0.23	100.0	7	2	5	"	"
HAB 31	57	6.4	0.27	99.0	9	2	3	"	"
Albumin Prepared from Plasma Fractionated within 72 Hours after Blood Donation									
HAB 10	47	6.6	0.29	98.5	10	2	5	"	"
Specifications of National Institutes of Health and Commission on Plasma Fractionation									
		6.8±0.2	0.33—	97.0+	15	"shall remain substantially unchanged"	20—		

elometric units (NU) and increases no more than 20 units in 50 hours at 57° C. At 50° C. it should "remain substantially unchanged" for at least 12 days. Table 1 shows that preparations obtained from outdated blood fall well within these limits. All the preparations required at least 100 hours heating at 57° C. before they increased in turbidity 20 nephelometric units.

γ-GLOBULIN

The dried γ-globulin obtained by Method 9 from Fraction II+III was reconstituted at a pH of 6.8±0.4 as a 16.5 per cent protein solution containing 2.25 per cent glycine as a stabilizer.[9] The preservative was 0.01 per cent merthiolate as specified by the National Institutes of Health. Following reconstitution the material was sterilized by filtration through Hormann D10 sterilizing pads. Bulk sterility and rabbit pyrogen tests were made before filling the final containers. During the time required for these tests, determinations of free cholesterol by a modification of the method of Bloor,[10] electrophoretic purity, gelation time at 57° C., and titrations for diphtheria, typhoid H, and influenza virus antibodies[11] were made. Following filling of the γ-globulin into 2 ml. vials, guinea pig and mouse safety tests were carried out. When the laboratory tests showed that the material was satisfactory, it was furnished to a clinician for human safety tests.

The control tests for the γ-globulin salvaged from outdated blood are summarized in Table 2. Included in the table are seven such preparations (IIGB 4,5,6,8,9,10,11), and one preparation (IIGB 7) obtained from plasma fractionated within 72 hours of blood donation.

All the preparations fall within the pH range of 6.8±0.4 specified by the Commission on Plasma Fractionation and the National Institutes of Health. The maximum level of cholesterol content permitted is 0.2 mg. per ml. All of the preparations listed in Table 2 are below that figure with the exception of IIGB 8 which is 0.25 mg. per ml. All

TABLE 2

Chemical and Clinical Qualities of γ-Globulin

Preparation	Volume Final 6.5 per cent solution	pH	Cholesterol content	γ-Globulin Purity	Thermal Stability	Antibody Content Ratio to Reference Standard IIG 141			Results of Safety Tests	
									Animal	Human
	liters		mg/ml	%	hrs to gel at 57° C.	Diphtheria	Typhoid	Influenza		
	γ-Globulin Prepared from Plasma Fractionated over 21 Days after Blood Donation									
IIGB 4	1.2	6.8	0.12	99.0	12	0.8	4.0	1.0	satisfactory	satisfactory
IIGB 5	1.1	6.8	0.08	100.0	11	0.9	4.0	1.5	"	"
IIGB 6	1.2	6.8	0.02	100.0	11½	1.0	4.0	1.0	"	"
IIGB 8	1.1	6.8	0.23	99.0	16½	1.0	2.0	1.0	"	"
IIGB 9	24.0	7.1	0.07	97.0	9½	1.1	2.0	0.9	"	"
IIGB 10	22.0	7.0	0.13	99.0	10	1.0	2.0	1.5	"	"
IIGB 11	23.0	6.7	0.11	99.0	12	1.0	2.0	2.4	"	pending
	γ-Globulin Prepared from Plasma Fractionated within 72 Hours after Blood Donation									
IIGB 7	4.4	6.4	0.19	99.0	20	0.9	2.0	0.9	"	satisfactory
	Specifications of National Institutes of Health and Commission on Plasma Fractionation									
	6.8±0.4		0.2	90.0+	"shall require at least 4 hours"	0.5+	0.5+	0.5+		

contain at least 97 per cent γ-globulin by electrophoretic analysis. The minimum specifications require at least 90 per cent purity using electrophoresis measurements as the standard.

Thermal stability tests indicate that γ-globulin prepared from outdated blood is as stable as that prepared from fresh blood, and more stable than is required by the organizations mentioned above. Thermal stability of γ-globulin is expressed in hours to gel at 57° C. The minimum gelation time permitted is 4 hours. Most of the γ-globulin prepared from outdated blood in this laboratory can be heated for at least 10 hours at 57° C. before gelation.

The titers of diphtheria, typhoid H, and influenza A antibodies made on the γ-globulin preparations above were compared to an active and acceptable reference standard (Lot IIG 141). Table 2 shows that, whereas the minimum specifications require a ratio of antibody content to the reference standard of no less than 0.5 for the three antibodies tested, the ratios of all the preparations above were much higher than this. A survey by Banton and Mulford [12] on the modification and prevention of measles in man indicates that the measles antibody content in most of the γ-globulin preparations above was high. The material was also demonstrated to be effective in the prevention of infectious hepatitis.[13]

The safety tests required by the National Institutes of Health on animals indicated that the material was safe for use clinically. All the preparations recorded in Table 2 when tested for pyrogenic reactions in rabbits by the procedure recommended by the National Institutes of Health were shown to be pyrogen-free. So far, no pyrogenic γ-globulin has been obtained from outdated blood in this laboratory.

DISCUSSION

A salvage operation for the production

of γ-globulin and albumin from outdated blood has proved of great value. Without it the need for both proteins in Massachusetts during the past two years could not have been met. Approximately 2,800 units of albumin and 37,000 units of γ-globulin have been made available for distribution from this source.

No problems have been encountered because of the physical condition of the starting material. Occasionally a bottle of outdated blood that is highly hemolyzed is received. This is considered to be not usable and is discarded. Most of the time, however, the blood is returned soon after the expiration date in good condition, indicating that it has been stored and handled properly. The blood is not centrifuged, as the added volume of plasma gained by centrifuging is overbalanced by the increase in hemolysis which results from centrifugation. Usually a level of 150 to 225 ml. of citrated plasma are obtained, the amount depending upon the care in handling and shipping to the laboratory. In all of the outdated plasma pools the hemoglobin level has been less than 200 mg. per 100 ml. At frequent intervals, tests for sterility are made on random bottles of returned blood. Only occasionally is one found that is contaminated.

The bottle into which the blood is drawn has little effect upon the albumin and γ-globulin contained in the harvested plasma. The Massachusetts program has always used the Fenwal gravity bottle for which a specially designed apparatus for the sterile removal of the plasma has been developed. The laboratory does, however, receive outdated blood originally drawn at hospital blood banks into vacuum type bottles. The plasma obtained from this type of bottle is perfectly satisfactory for salvage but its removal from the bottle aseptically is more difficult on a large scale than from the Fenwal gravity bottle.

A study to determine whether or not it is possible to salvage other proteins of outdated blood is in progress: e.g., the isolation of the isohemagglutinins.

SUMMARY

1. The plasma from preserved human blood held at refrigerator temperature in acid citrate dextrose (ACD) solution for over 21 days has been fractionated by the ethanol water method of Cohn, *et al.*

2. The γ-globulin and albumin preparations obtained from such outdated blood have been found to meet or exceed official standards as regards chemical purity, thermal stability, freedom from pyrogens, antibody titer, clinical safety and other significant criteria.

3. A program for salvaging the plasma from outdated blood has furnished an additional source of starting material for the production of human plasma fractions.

NOTE: We are indebted to Miss Julia Sullivan for the antibody titrations, to Dr. William Wallace for the sodium determinations, to Miss Barbara Gillis, Mrs. Doris Hulick, and Dr. John M. Newell for the stability, electrophoretic and cholesterol results, to Miss Leslie H. Wetterlow for sterility and identity tests, to Miss Louise Wyman for animal safety tests, to Dr. C. A. Janeway for human safety tests, to Mr. Robert Kelty for his technical assistance in fractionation, and to Dr. Geoffrey Edsall for his valuable advice which helped to bring the study to a successful conclusion.

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Accreditation of Field Training Programs

Following a Conference on Accreditation of Field Training Areas in Ann Arbor, April 19 and 20, plans are being made for a survey of existing field training areas for the residency type of training, namely, an extended period of active service under supervision in a public health program.[1] Haven Emerson, M.D., has been appointed by the Association to serve as Consultant on this program. The initial effort is to find out what state programs presently exist. This inquiry would be greatly facilitated if each state health officer in whose state a program on the state or local level or both is in operation or in early prospect, would furnish to Dr. Emerson and the Field Training Accreditation Program a brief description of the residency field training program now in existence, with particular reference to medical administrative personnel. He should indicate further whether he wishes to have this program visited and considered for accreditation. Address Field Training Accreditation Program, American Public Health Association, 1790 Broadway, New York 19.

[1] *A.J.P.H.* 37, 6:709-714 (June), 1947.

A Clinical Trial of Immune Serum Globulin Prepared from Outdated Liquid Plasma

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THE control of measles with immune serum (gamma) globulin has become such a well recognized addition to modern therapy that the demand for this product has risen sharply.[1] The source of this globulin is human blood and the present rate of blood donations, unstimulated by war, is so low that the future supply of gamma globulin appears somewhat uncertain. The experience of the Massachusetts Blood Program,[2-4] now operated by the American National Red Cross, is that the demand for whole blood for transfusions exceeds the total supply of blood for at least ten months of the year. There is almost no fresh blood available, in the above mentioned program, for processing into such fractions as immune serum globulin. This fraction would be very low in supply at the present time were it not for the surplus stocks of Army and Navy dried plasma which were turned over to the American Red Cross after V-J day. Globulin prepared from this source is being used up rapidly and the stockpile could well disappear if it continued to be used without adequate replenishment.

In the effort to find a new source for such fractions the Division of Biologic Laboratories of the Massachusetts Department of Public Health has prepared immune serum globulin from outdated liquid plasma.[4, 8] The source is the plasma from blood that has become more than 21 days old, on the shelf of the blood bank in a hospital coöperating with the Massachusetts Blood Program. Many such bloods are returned to the laboratory and form another source of plasma. It was formerly believed that such material was unsuitable for the manufacture of gamma globulin. Clinical and laboratory evidence[4, 8] accumulated in this laboratory indicates, however, that outdated plasma may be fractionated to yield a gamma globulin equal in all respects to that obtained from fresh plasma. This report describes some clinical trials of globulin prepared from outdated plasma.

The starting plasma used for the preparation of this gamma globulin is obtained as follows:

From normal donors, 475 ml. of blood are drawn into bottles containing 75 ml. of an anticoagulant mixture made up of 1.45 gm. of sodium citrate, 0.55 gm. of citric acid, and 1.65 gm. of dextrose. The buffered citrate solution, commonly called "ACD," has a pH of 5.00 and permits storage of whole blood for at least 21 days at +5° C. without appreciable hemolysis. Immediately following the donation, the blood is chilled

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at +5° C. in a water-ice bath and is kept in an insulated case maintained at +5° C. with dry ice until it is transferred to the laboratory. At the laboratory, it is stored in a +5° C. cold room. When the blood group and Rh type are determined, and a negative serologic test is reported, the blood is distributed to hospitals by regular weekly shipments in insulated cases at +5° C., and stored at +5° C. until used. Usually, 10 to 20 per cent of that distributed to hospitals is not used within 21 days, and is returned to the laboratory along with outdated bloods drawn by the hospitals themselves. Some of the blood comes back with very little change from the normal appearance of the plasma, but most of it comes back with the plasma showing various degrees of hemolysis. In spite of this, however, very little that is returned has to be discarded because of excessive amounts of hemoglobin in the plasma.

The plasma is pooled and either stored in the frozen state for fractionation or fractionated immediately by Method 6 of Cohn, *et al.*[5] Fraction II and III is subfractionated to Fraction II or gamma globulin by Method 9 of Oncley, *et al.*[6, 7] Following drying from the frozen state, Fraction II is reconstituted, as needed, at pH 6.8 ± 0.4, as a 16.5 per cent protein solution, with a diluent containing 2.25 per cent glycine as the stabilizer, and is filled as soon as satisfactory bulk tests are reported. The final containers used in this investigation contain a volume of 2 ml. of the above solution. Each preparation has met all the specifications of the National Institutes of Health and the Commission on Plasma Fractionation and Related Processes. A report on the results of physical, immunological and biological control studies on these preparations, and a comparison of these findings with results obtained in tests of gamma globulin prepared from fresh plasma, is presented separately.[8]

In Massachusetts, distribution of material for clinical trial from Lots IIGB 4, 5, 6 and 8 prepared as above was begun July 1, 1948, and a total of 898 vials of 2 ml. each was distributed by July 8, 1948. Distribution was quite general over the Commonwealth, the globulin going to 54 boards of health, 16 physicians direct, and 8 hospitals direct. In each 2 ml. package a printed slip was enclosed explaining that the material was for clinical trial, and requesting the physician to make a report on the government postal card which was wrapped around each package. On the back of the card was a printed questionnaire, so designed that reporting consisted largely of checking certain blank spaces. Reports came in very slowly; therefore on August 18 the Director of the Biologic Laboratories wrote a follow-up letter to boards of health, hospitals, and doctors who had not made any report. This stimulus brought in some more replies. The available reports were tabulated and 126 replies, with sufficient data to be of value, form the basis of this report.

Age Distribution of Recipients—The age distribution ranged from 7 weeks to 36 years but only two were over 9 years of age.

TABLE 1

Age Distribution of Recipients

0–6 mo.	—	3	72
6–12 mo.	—	12	
1 yr.–2 yrs.	—	37	
2 yrs.–3 yrs.	—	20	
3 yrs.–6 yrs.	—	37	
6 yrs. +	—	17	

The combined groups under 3 years comprise 72 recipients, or 57 per cent of those reported. This age group is recognized as the most dangerous one in which to have measles; so the globulin was apparently given with a generally good understanding of its proper use.

However, it is possible that the low overall rate of reporting was due in part to reticence in reporting use of this critically scarce product in older persons, in whom the indications for its use are usually hard to establish.

The relative difficulty in procurement of the product makes it desirable to limit its use to the youngest age groups and debilitated or ill older persons. The greatest danger from measles is in the group 4 years of age and under. The experience with measles deaths in Massachusetts is given by the Director of the Division of Communicable Diseases for the Commonwealth in Table 2.[9]

TABLE 2

Measles Deaths in Massachusetts for the Period of 1936–1947 Inclusive

Age	% of Deaths	
0–1	23.5	
1	26.5	
2	9.5	70%
3	5.0	
4	5.5	
5–9	18.0	
10–14	5.5	
15–19	2.0	
20–24	1.5	
25–29	1.0	
30 +	2.0	

These figures indicate that 70 per cent of measles deaths occur in persons 4 years of age and under. This group, not yet 5 years of age, is but 5.51 per cent of our population. The present recommended procedure for use of gamma globulin is to modify measles in children over 4 years of age, and in those who are younger to prevent the disease. On the other hand, healthy older children may properly be allowed to have full blown measles in order to secure proper immunity, since permanent immunity may not invariably follow modified measles.

Sex Distribution—The sex distribution of the 126 cases studied was as follows:

Males	71	—	56.3%
Females	53	—	42.1%
Not Stated	2	—	1.6%

Length of Exposure Period—The average reported duration of the period of exposure to measles prior to injection with gamma globulin was 3.2 days.

Onset Date: Nature of Disease Observed—There were 27 cases of measles, of which 4 were of average severity and 23 were mild. The average incubation period of the entire group was 15.2 days. There were 4 of these, however, in which the question was apparently misunderstood as these 4 were reported as having, in each case, but 4 days' incubation period. Disregarding these four reports the average incubation period on the remaining 23 cases becomes 19.8 days which shows some prolongation, as is expected when measles is modified.

Complications following Measles—There were no reported complications occurring following measles in any of those who received this lot of globulin. In 7 cases this question was not answered, and the patients were presumably also free of complications.

Dosage Employed and Results Obtained—Dosage varied with weight and the desire to modify or prevent measles.

Average dose	1.83 ml.
Average dose for modification	1.44 ml.
Average dose for prevention	2.23 ml.
Range of dosage	0.36 ml. to 7 ml.

Results of the use of this material are shown in Table 3.

Dosage is best considered in relation to degree of deviation from optimum dosage. The scatter diagram shown in Figure 1 represents the degree of deviation from optimum dosage related to body weight and to the desire of the physician to prevent or to modify measles by the injection. The values used for calculation were 0.02 ml. per lb. body weight as optimum for modifi-

TABLE 3

Results Obtained

Age Group	Desired to Modify—55			Desired to Prevent—70			Total Number In Group
	None	Mild	Avg.	None	Mild	Avg.	
<6 mo.				3			3
>6 <12 mo.	1			9	1		11
>1 yr. <2 yrs.	6	3	2	24	1		36
>2 yrs. <3 yrs.	6	2		11	1		20
>3 yrs. <6 yrs.	11	12	1	13	1		38
>6 yrs.	9	1	1	5	1		17
	33	18	4	65	5		125

cation of measles, and 0.1 ml. per lb. for prevention. The values are given by age and by percentage of deviation, as a given deviation in volume increases in significance with smaller body weights. This diagram shows the degree of success of the physicians in obtaining prevention or modification as desired. The patients who were given the globulin to secure modification and manifested prevention instead did not obtain the result wanted, hence are classed as failures.

Of those patients in whom modification was desired, success was attained in 18 out of 55, or 32 per cent, in that they obtained mild measles. Thirty-three, or 60 per cent, had no measles and 4, or 8 per cent, had average measles. In other words 68 per cent of the attempts to modify were unsuccessful. The group in whom measles prevention was desired had much better success as 65 out of 70, or 92.8 per cent, of those receiving immune serum globulin for the purpose of prevention had no measles, 5, or 7.2 per cent, had measles in a mild form, and none had average measles. These results indicate that it is still

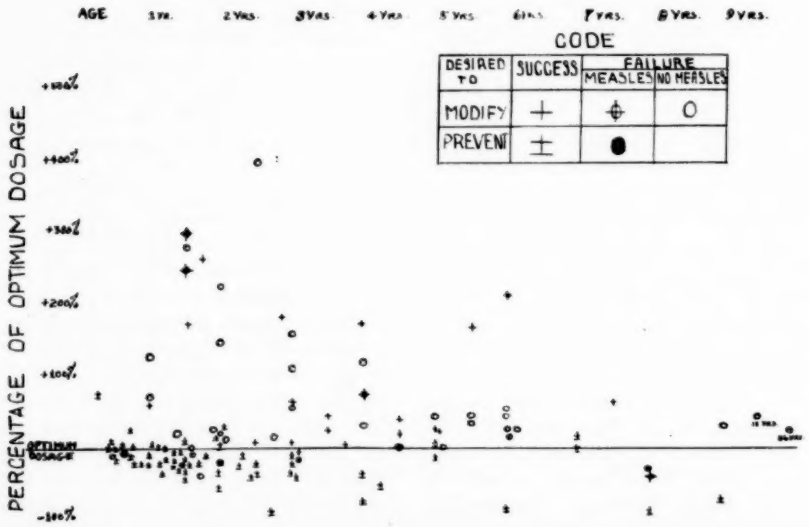

FIGURE 1—Scatter Diagram—Per cent of Optimum Dosage.

quite difficult to secure the exact degree of modification desired by giving immune serum globulin. It also indicates that the present recommended spread of dosage 0.02–0.025 ml. per lb. body weight for modification should be shifted toward the lower margin, and that 0.02 ml. of globulin per lb. might be the better recommendation. In the cases studied there is a suggestion that the average dose was in fact an overdosage when given to modify measles. Complicating factors which make this reasoning inexact are the natural immunity to measles, possessed by a few people, the loss of history of a previous attack which may have occurred in some cases, and the fact that an exposure to measles is not a quantitative phenomenon that will always produce measles of the same severity in a susceptible person.

Additional data proving the efficacy of this material when used against measles have been supplied through the courtesy of Dr. George W. Dana and Mrs. Muriel G. Small from the department of Dr. Charles A. Janeway in Children's Hospital, Boston. These workers distributed immune globulin, made of outdated plasma and secured from the Massachusetts Biologic Laboratories, to several cities about the United States. The data in Table 4 collected and tabulated by Dana and Small show results consistent with experience in this state, so that this material has behaved consistently all over the United States. The material shown in this tabulation was used in the period between May 15, and July 1, 1948.

Another disease for which immune serum globulin is supposed to be effective is infectious hepatitis. An unusual opportunity to test the efficacy in this disease of gamma globulin from outdated plasma arose in the use of this material by Dr. Joseph Stokes, Jr., in controlling an outbreak of hepatitis in a large institution in Pennsylvania. This study will be the subject of a paper to be published as "Prolonged Control of Epidemic Hepatitis (IH virus) by a Single Injection of Gamma Globulin (Farquhar and Stokes)." These authors have been kind enough to prepare a paragraph concerning their experience and authorize its inclusion in this article. Their report is quoted as follows:

> The gamma globulin was used for passive protection in a large isolated state colony for retarded males (850 inmates) against an outbreak of epidemic jaundice, which in all involved over 14 per cent of the entire colony with two deaths. The epidemic apparently was transmitted by personal contact, since the more cleanly employees, although mostly living in close association with the inmates, escaped with but three exceptions. Gamma Globulin, 0.6 ml. per lb. body weight, was injected into 248 inmates chosen, with 262 controls, by alphabetical alternation from most of the cottages. The slight excess of controls resulted from refusal of a few inmates

TABLE 4

Summary of Use of Gamma Globulin from Outdated Plasma (data furnished through courtesy of Dr. C. A. Janeway)

IIGB4	*To Prevent*	*To Modify*	*Total*	*No Measles*	*Mild Measles*	*Average Measles*
San Francisco		17	17	11	6	0
Detroit	9	5	14	11	3	0
Philadelphia		10	10	9	1	0
Total	9	32	41	31	10	0
IIGB5						
Philadelphia	1	10	11	10	1	0
Detroit	6	28	34	26	8	0
Salt Lake City	1	1	2	1	0	1
Total	8	39	47	37	9	1

selected for injection, to accept it. Those omitted from the study included (1) colored, (2) those who had just had hepatitis, (3) the employees, (4) inmates over 40 years of age, (5) certain more isolated cottages. If the first 5 days following the date of injection are omitted, which appears justifiable, in the succeeding three months period, jaundice developed in one of the injected group and in 34 of the controls. The results could be explained in one of three ways: (1) by chance, which is almost negligible, (2) by passive immunization alone, which is possible, or (3) by passive, supplemented by active, immunization which appears to be the most probable explanation. Obviously the findings agreed closely with the positive results previously reported in other epidemics of jaundice.

Incidence of Reactions Following Injection of Gamma Globulin—In Massachusetts, the reactions to the injection of the material were negligible. Three reports of what appeared at first to be true reactions were considered on further study as representing measles with onset shortly after the globulin was administered. Three other reports designated as "reactions," all of which were from the same physician, also described symptoms related to the onset of mild measles, i.e., "running nose and cough," "slight rash and running nose," and "rash and cough—no temp." In 2 of these cases mild measles began 4 days after inoculation and in the 3rd the onset of mild measles occurred 14 days after inoculation. Thus, none of these reactions are believed to have been due to administration of gamma globulin.

Despite the statistical imperfections in the data presented, and particularly the lack of uninoculated control subjects, the two sets of data concerning the action of this gamma globulin against measles present such uniform results as to leave no doubt that there is antibody in the preparation. The suggestion has been made[10] that these preparations might be more powerful against measles than the material previously studied. The fact that in each group only about one-third of the subjects who should have got mild measles, did so, the absence of severe cases of measles, the absence of complications, and the prolonged incubation period in the mild cases, all indicate that the immune serum globulin prepared from outdated liquid plasma was at least equal in ability to control measles, to similar globulin made from fresh plasma.

The brilliant results achieved in controlling the hepatitis outbreak with the same gamma globulin are, as Stokes points out, unlikely to have happened by chance, but must reflect the immunizing power of the material.

CONCLUSION

Immune serum globulin prepared from outdated liquid plasma has been shown to be effective in control of measles and of infective hepatitis, two diseases in which such globulin is of proven value. Outdated liquid plasma is an additional source of potent gamma globulin.

TABLE 5

Reactions to Injection

Sex	Age	Wght. lbs.	Dosage ml.	Time of Reaction after Injection	Injection Date	Exposure Date	Measles or None	Description
F	2 8/12	29	0.2	unstated	July 8	July 5	none	"Slight Malaise"
M	1 11/12	32	0.8	1 wk. later	July 20	July 18	none	Slight fine rash overnight. No systemic reactions.
M	1 2/12	21 1/2	2.2	1 day later	July 15	July 6	none	"T.102° and rash on buttocks 1 day after injection — only 1 day."

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VD Research Laboratory Moves

The Venereal Disease Research Laboratory of the U. S. Public Health Service in March was transferred from the Marine Hospital, Staten Island, N. Y., to the Communicable Disease Center, Atlanta, Ga. The purpose of this move is "to carry out plans for coördination of serologic evaluation and applied research in venereal diseases with the varied research activities in allied fields now being conducted at the Center." It also puts the laboratory in an area of high prevalence of venereal disease and a great opportunity for advanced research.

Ad Harris continues as Chief Serologist of the Laboratory which also remains under the technical supervision of the Division of Venereal Diseases. Services heretofore furnished to state health departments are also continued.

Further Studies on the *in vitro* Test for Virulence of *Corynebacterium diphtheriae*

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IN a previous paper [1] several possible causes of falsely negative reactions in the *in vitro* virulence test for *C. diphtheriae* were described. The chief difficulty appeared to be the use of improperly collected serum in testing minimus strains which react more weakly than mitis or gravis strains.

The following study was undertaken to provide a more suitable medium for testing minimus [2] strains. To do this, the serum, the antitoxin, and each ingredient in the basal medium was subjected to investigation to determine whether or not it was necessary to the reaction or whether a more suitable substance could be substituted. The same general technique described in the previous paper was used in this study.

SERUM

Due to the "inhibitory" effect noted in some lots of rabbit serum, even when carefully collected to avoid hemolysis, various other proteins were substituted for it with the idea of obtaining a more uniform enrichment.

Egg white, whey, gelatin, and bovine albumin were tried in varying concentrations. Also, one lot of Difco horse serum in ampules was tried. None of these substances gave positive reactions with any of the known virulent strains tested. Therefore, the idea of a substitute for serum was discarded and a method for collecting more satisfactory lots of sera was developed.

Experience in this laboratory has shown that the highest yield of hemoglobin-free rabbit serum is obtained by placing not more than 25 ml. of freshly drawn rabbit blood in separate Petri dishes 15 x 150 mm. in size. These are allowed to stand undisturbed for 3 to 4 hours and the serum is then removed by tilting the dish and pipetting off the serum which has collected on top of the thin layer of blood. When more than one rabbit is bled, the serum from each rabbit is centrifuged separately. The sera may then be pooled if desired but must be centrifuged a second time. Serum should be free from any trace of hemoglobin. It may be stored in the icebox and used as long as it remains sterile. It may also be kept frozen if desired. *Each separate lot of sera should be carefully tested with minimus strains before negative results may be depended upon.* When a reliable base is used, the time required for the reactions to appear and their intensity, depend entirely upon the serum used, with different lots showing wide variation.

STUDIES OF THE BASAL MEDIUM

1. *Peptones*—To test various peptones, our basal medium was prepared

according to the following formula:

M-1 Formula of Elek *

Various peptones (as noted below)	2	gm.
Maltose	0.3	gm.
Lactic acid	0.07	ml.
Agar	1.5	gm.
NaCl	0.5	gm.
Water	100	ml.

* Slightly modified as to preparation only.

Details of preparation were as described in our previous paper with the exception that, to 100 ml. portions, 2 gm. of the various peptones noted below were substituted for the Proteose peptone (Difco) used by Elek. The reaction of each medium was adjusted to pH 7.8 and the medium was then sterilized. Comparisons were made with the M-1 medium containing Proteose peptone prepared in the usual manner.

Substituted Peptones

1. Protone (Difco)
2. Tryptone (Difco)
3. Bacto peptone (Difco)
4. Tryptose (Difco)
5. Neo-Peptone (Difco)
6. Phytone (BBL)
7. Casein hydrolysate (GBI)
8. Proteose No. 3 (Difco)

Base prepared with Proteose No. 3 and Tryptose (Difco) gave only faint reactions with minimus strains and good reactions with mitis and gravis strains. Neither peptone showed as marked reactions as did the Proteose peptone. None of the other peptones gave positive reactions with any of the virulent strains used for testing. Difco Proteose peptone remains the most satisfactory of all peptones tested.

2. *Carbohydrates*—A series of comparative tests was made using the Proteose peptone basal medium without added carbohydrate or alcohol and with the following substances substituted for maltose. Comparisons were made in the same manner as for peptones.

Monosaccharides

l-Arabinose
Dextrose
Galactose
l-Rhamnose
d-Xylose

Disaccharides

d-Cellobiose
Lactose
Sucrose
Trehalose

Trisaccharides

Melezitose
Raffinose

Polysaccharides

Glycogen
Starch

Alcohols

Adonitol
Dulcitol
i-Inositol
Mannitol
d-Sorbitol

Dextrose was found to be unsatisfactory due to fermentation and clouding of the medium. Maltose and trehalose seemed to inhibit early positive reactions of the minimus strains. Of all the substances tried, none gave better results than the basal medium with carbohydrates omitted entirely.

3. *Other Ingredients of the Basal Medium*—After varying the concentrations of sodium chloride and lactic acid, and the pH in numerous combinations, the following conclusions were drawn:

1. Slightly better reactions were obtained, and they were visible sooner (at 24 hours) by reducing the salt content from 0.5 per cent to 0.25 per cent.
2. Lactic acid could be omitted entirely.
3. The reaction took place more readily at a pH of 7.8 than at 7.2.

NEW MODIFIED BASE, M-4

A simplified medium was then prepared as follows, based upon the foregoing experiments:

Proteose Peptone (Difco)	2	gm.
Granulated Agar (Difco)	1.5	gm.
NaCl C. P.	0.25	gm.
Distilled water	100	ml.

Adjusted to pH-7.8
Sterilize 15 lb., 15 minutes.

This medium, M-4, was then compared with the M-1 base which was our original modification of the Elek formula. Using, in both, the same lot of rabbit

serum, the two media were used to test 12 different minimus, 1 gravis, and 1 mitis strains all known to be virulent. The results are shown in Table 1.

TABLE 1

Comparison of M-1 and M-4 Base

			M-1 *		M-4	
Culture No.		*Type*	*24 hr.*	*48 hr.*	*24 hr.*	*48 hr.*
1.	Cf–4a	Minimus	–	2w†	–	4w
2.	Cf–31	Minimus	–	4w	–	4w
3.	A–621	Gravis	4s†	4s	4s	4s
4.	NS–1051	Minimus	–	–	–	4w
5.	NS–805	Minimus	–	–	–	4w
6.	NS–589	Minimus	–	2w	–	4w
7.	A–267	Minimus	–	1w	–	4w
8.	A–366a	Minimus	–	–	–	4w
9.	A–389	Minimus	–	–	–	4w
10.	A–34	Minimus	–	–	–	4w
11.	Cf–35	Minimus	–	2w	–	4w
12.	A–494	Minimus	–	–	–	4w
13.	A–480	Minimus	–	–	–	4w
14.	A–15	Mitis	4s	4s	4s	4s

* Note: In 72 hours all cultures gave positive virulence tests.

† Figures = Number of lines of flocculation.
w = Weak reactions; i.e., Faintly visible lines.
s = Strong reactions; i.e., Readily visible lines.

The M-4 base not only yielded positive reactions with all the virulent cultures in 48 hours but the reactions were noticeably stronger than were those obtained with the M-1 base.

The M-4 base was further tested with the following numbers and types of *C. diphtheriae*:

	Virulent *	*Avirulent* *
Minimus	18	3
Mitis and mitis-like	8	10
Gravis and gravis-like	10	10
Indeterminate	2	7
Saccharose fermenter	1	–
Diphtheroids	–	22

* By standard intradermal test in rabbits and/or chicks.

All of the above virulent strains gave strongly positive reactions on this base within 48 hours, many within 24 hours. All of the avirulent cultures gave negative reactions with the exception of two minimus strains, labeled as avirulent on the basis of animal tests, which gave strong positive reactions. These two cultures were subsequently retested on rabbits and found to give faintly positive reactions which would ordinarily be considered negative in routine work.

It seemed from this experience that some cultures which, on rabbits, give positive reactions so slight as to be overlooked may easily be read as definitely positive by the plate test. To investigate this point further, 34 strains of minimus type were taken from stock. These strains had been isolated during 1946 in Baltimore, and had yielded a high percentage of negative or doubtful virulence tests in rabbits; i.e., 23 had been reported as avirulent, 5 as of doubtful virulence, and 6 as virulent.

When tested by the plate method, all except 2 strains gave positive reactions. The same broth cultures when again injected into rabbits in this laboratory showed only 2 strains to be completely avirulent (the same 2 which were avirulent on the plate). Five yielded doubtful reactions and 27 gave positive reactions. Many of these positive reactions on rabbits showed no necrosis (a common basis for calling a reaction positive) and only a very small erythematous area which was controlled by antitoxin. It might be added that in 1946 these minimus strains, which are now known to give confusing results in tests on rabbits, had been described only recently then, and with the slight reactions they gave on rabbits were not recognized as virulent. Similar strains tested in previous unpublished work by two of the authors have been proved virulent by causing late death or paralysis of the wings when tested in chicks.[3]

The 5 cultures yielding doubtful virulence tests on the first rabbit were retested on another rabbit and proved to be weakly virulent.

4. *Diphtheria Antitoxin*—At one time during the course of this investigation a sample of antitoxin was used, in contact with which virulent cultures produced multiple lines of reaction. From 4 to 16 faint lines formed between the filter paper strip and the 4 distinct lines forming the true reaction. These aberrant

lines appeared on one series of plates on which the normal lines did not appear at all, due to an inhibitory lot of rabbit serum. This phenomenon is at present being studied. So far it has been encountered only in 3 different lots of antitoxin from Parke-Davis and Co., in 1 lot from Eli Lilly Co., and in 1 lot of German antitoxin (Behringwerke). Squibb, Wyeth, and Lederle antitoxins have given consistently normal results.

The same phenomenon has been observed in tests with several avirulent (nontoxigenic) strains. This indicates that the aberrant lines are related to some antigen—or antibody distinct from exotoxin or antitoxin.

DIRECT TESTS

It has been found convenient, when rapid reports are desired, to streak plates for testing virulence with colonies fished directly from the cystine tellurite plate. This is a very satisfactory and rapid means of determining virulence. However, it must not exclude cellular morphological studies of pure cultures from Loefflers or Pai slants.

DISCUSSION AND SUMMARY

Provided the rabbit serum enrichment for the *in vitro* test has been tested and found to give satisfactory results with minimus strains of *C. diphtheriae*, and provided recommended precautions are taken in the preparation of the medium, the results of the *in vitro* test are more easily interpreted than parallel intradermal tests on rabbits when dealing with minimus strains of *C. diphtheriae*. Some of these yield reactions in rabbits so faint and doubtful as to pass for negative in routine examinations.

The *in vitro* test is certainly a simpler and less expensive method for determining virulence than are any of the animal tests formerly used. It appears to be as reliable as the rabbit test, and even more so for minimus strains. It is also more rapid, since in most instances readings may be made with assurance in 18–24 hours.

As a result of the studies described in this paper, the M-4 base has been adopted for regular use in this laboratory. It is more satisfactory for testing minimus strains of *C. diphtheriae* than the M-1 base previously described. This new base is in no way less sensitive for mitis or gravis strains, nor has it given falsely positive reactions with known avirulent strains or with diphtheroids.

In performing the test it is essential that only such commercial antitoxins be used as have been demonstrated to give proper positive and negative reactions and not to produce multiple or other abnormal reactions with avirulent cultures.

For completeness of documentation references to several publications concerning the *in vitro* virulence test which have come to our attention since our last communication are appended.[4-9]

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Organization of Topical Fluoride Demonstration Units on a Regional Basis*

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AFTER more than eight years of research with more than 15,000 children in various sections of the United States,[1-7] it became increasingly apparent that topical applications of a 2 per cent sodium fluoride solution to the teeth of children are a practical and effective method for reducing the incidence of dental caries. In the early months of 1948, it was decided to promote and put into general use, the technic that proved so effective on the experimental group of children. Even though backed up with accepted scientific evidence, new health methods and technics are not always readily accepted by the public and the profession. There is generally a lag between scientific knowledge and its application to health problems.

Experience indicated that an intensive information program and a thorough training of personnel in the methods and technics of the new procedure must precede any attempt to utilize this newly found preventive procedure on a nation-wide scale. It was with this in mind that the Committee on Appropriations of the House of Representatives 80th Congress [8] recommended that funds be made available to carry out demonstrations in the several states and territories to make the effects and the technics in question widely known both to the profession and the public. Upon the recommendation of this committee, Congress appropriated funds for conducting demonstrations in each of the states and several territories of the approved technic. These demonstrations were to train state and local health department personnel in the application technic and to bring the procedure to the attention of dentists. The demonstration would provide a base for the establishment of local sodium fluoride programs on a nation-wide scale.

INTRODUCING THE TOPICAL SODIUM FLUORIDE UNITS

Immediately after funds were made available for the demonstration project, it became the duty of the Regional Dental Consultant to advise each state dental director and state health commissioner on the objectives of this project, and on how it was to function, and what must be done to get the demonstration for their state. In every case the state dental director met with the state council on dental health to explain the objectives of the project and to decide if the state wanted the project to function within its borders. Four of the 7 states in Regions IV and V decided favorably for the project and were sent

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demonstration units. In every case, the state health department, after the official approval by the state council on dental health, made an official written request to the Regional Medical Director for a demonstration unit.

PERSONNEL

Recruitment of hygienists, dentists, and clerks was a particularly difficult problem for the first year's operation. All schools of dentistry and dental hygiene, in the area, were contacted and the program outlined to the senior students. Much interest and enthusiasm was shown by the students and some made applications for positions on the demonstration units. The students were advised that they might indicate a choice by areas or states and, if possible, they would be assigned to their chosen areas.

In August, 1948, the personnel for the several teams to be used in Federal Security Regions IV and V were called to duty. They reported to the dental consultant for a one week training period to become acquainted with the objectives of the demonstration program, and to learn the sodium fluoride application procedure and the examination technic. Record forms and governmental procedures were fully explained to the entire group. The various specialized program consultants in the Regional Office were given a place on the program to explain their particular projects. It was believed that a general overall picture of all public health fields was indicated and that a better insight was gained into the objectives of the topical sodium fluoride demonstration project.

At the conclusion of this training period the teams were assigned to their respective states in the region. In every instance, the first assignment was made to a state institution for children. Here, the unit had one month to six weeks further training in developing their technics and getting fully acquainted with all phases of the program prior to going out before the profession and general public to demonstrate. Visitors were welcome while at these institutions, but a general invitation was not issued during this period. This type of training proved to be ideal for personnel on the teams. It helped them to become better acquainted with each other, resolved their differences, standardized the technic, and enabled them to become an efficient, smooth working unit. At first, scheduling of patients proved to be a difficult problem, but here again training provided some of the answers which were of great value in future operations. To provide additional information and assist in the training, the dental consultant and public health representative made frequent visits to the teams.

All activities in organizing a local community for the reception of the topical fluoride team are carried out by the Dental Division of the State Health Department in coöperation with the local health department, school authorities, and the local dental society. Scheduling children for fluoride applications is not much of a problem during the regular school year. All informational material is directed toward acquainting the public with the demonstration program. Personal contacts are made with the dental society to give them the details of the objectives of the project.

SUMMER PROGRAM

Some difficulty was experienced in setting up an acceptable summer program. Children cannot be scheduled in the manner which is regularly used during the school year. In most cases the local health department assumed the responsibility of scheduling children for the summer program. It now appears that a larger community of 100,000 or more population is more ideally suited for a summer program than is a smaller community. The reasons seem to be twofold. First, there are more children concentrated in the larger communities

who are available for treatment, and second, there usually is a full-time local health department willing to coöperate in scheduling the required number of children. Usually the unit can remain in one area during the entire vacation period.

It was the consensus of all coöperating groups that it would be impractical at this time to carry on a summer program in a rural area where schools are not in session. In one predominantly rural county where all of the schools, except the consolidated schools, were in session, it was not too difficult to transport the children by school buses to the treatment center for the application. The school authorities coöperated fully in the project. Success is assured in the outcome of the program where all groups, including the state and local health departments, school superintendent, teachers, and the Parent Teachers Association coöperate.

QUARTERS

One of the problems that usually confront the dentist in charge of the topical fluoride demonstration unit is adequate quarters for operational procedures. The ideal room to accommodate this unit was found to be approximately 35 feet long and 25 feet wide with enough windows to provide sufficient daylight. This amount of space is found to be adequate to carry out the four chair-in-line technic of seating patients for each of the three operators. A room which has a sink, with hot and cold running water, is an added aid but not a primary requisite. The room should be provided with enough chairs to accommodate at least 25 children. These chairs are usually placed in the rear of the room in one line facing the operating unit. In this way the clerk is able to supervise the behavior of the children and continue her other duties.

A blue print of the ideal room and arrangement of equipment, together with a photograph of the room with the equipment in place, is to be furnished to each one of the units. This will aid the school superintendent in visualizing the project and help him to provide the proper quarters for the fluoride unit if available.

SECOND YEAR INSERVICE TRAINING PROGRAM

In August, 1949, a second orientation and training course was conducted in order that new and retained personnel might become more fully acquainted with all the phases of community dental health programs.

A four day lecture and practical training program presented accepted preventive dental procedures. The place of a good dental health program in an overall community general health program was discussed at some length. The course was a coöperative project between the state health departments in Regions IV and V and the Regional Office. Speakers were chiefly the state dental directors, assistant dental directors, and Regional Office personnel. Attendance was limited to state and local dental health personnel and members of the five demonstration teams in the two Regions. This procedure was thought to be a very practical way of teaching the teams the necessity of following the exact fluoride application. It also helped to clarify, in the minds of team members, the procedure and practices which should be included in a good dental health program. The training program presented an opportunity for all team members to participate in the discussions and clarified some of their individual problems.

AVERAGE PERFORMANCE OF TEAM MEMBERS

Figures submitted by the four teams in the two regions for the months of April, May, and June of 1949, show that the average team member will treat about 8 children per day. This includes

the prophylaxis and four topical applications. In a community with a continuing program, more cases may be completed by each operator because such a program will not necessitate periodic moves to other communities. Under a local community topical fluoride program, it might be expected that a hygienist can apply the solution on the teeth of from 2,500 to 2,800 children annually.

RELATIONSHIP AND COÖPERATION WITH STATE AND LOCAL HEALTH SERVICES

All plans for the proper functioning of the Topical Fluoride Demonstration team within a state are jointly formulated by the state dental director and responsible individuals in the Regional Office. Immediate supervision of the demonstration team within the state is, however, the direct responsibility of the state dental director. The state dental director compiles a list of all the communities requesting the services of the fluoride team. Every effort is made to choose locations in geographic areas where large numbers of professional personnel, as well as lay groups, have easy access to the demonstration. It is also desirable to reach into all areas of the state, so that the program is generally available for review by as many professional and lay people on a state-wide basis as is possible. In order that as many of the dentists in a community as possible may visit the demonstration, the local dental health committee (where one is established) is asked to coöperate by sending a written invitation to each dentist in the community to attend one of the clinic sessions. This procedure has brought as many as 50 per cent of the dentists in one of the more highly populated counties to the demonstration. It is intended that this plan be used by the dental societies in communities with a demonstration. It is most important that the dentists in the local community be properly and promptly advised on all plans and procedures of the demonstration unit. This responsibility rests with the dentist in charge of the unit, who is instructed to call on the chairman of the dental committee and discuss all matters of policy with him so that local dentists can be fully advised.

Publicity in regard to the project is a joint effort with the state health department, local health department, and the local dental society. General information on the effects of the topical application on the teeth together with all matters of local interest in regard to the project are usually included in news stories. Where possible, action photographs of the team and the dental committee are given space in the local newspaper. It is interesting to note that this type of written and visual information produces very favorable comments and results.

PLANNING OF CONTINUING PROGRAMS

The success of the topical sodium fluoride demonstration program must be evaluated by the number of communities which develop continuing topical fluoride programs of their own. Some communities express the desire to carry out such a project but have become discouraged by the lack of trained personnel. Whenever feasible, the Regional Office and the state health department coöperate in recruiting and training personnel to conduct topical fluoride programs in local communities. It is preferred that dental hygienists, under the supervision of a local dentist, conduct these local continuing programs. A number of such programs have been established in several of the states in Regions IV and V. Another type of continuing program is the dentist participation topical fluoride project. Each dentist in the community devotes a given time per week or month to this preventive measure. It may be accomplished in their own private offices or in a community clinic. A number of such projects have been

established in the states of Regions IV and V.

It is of major importance that more interest be stimulated in the dental hygiene profession as a career for women. A great many more hygienists need to be trained to carry out local topical fluoride programs on a national scale. In order to conduct such a vast training program, more schools of dental hygiene must be established. In Regions IV and V which include the States of Kentucky, Michigan, Ohio, Illinois, Indiana, Wisconsin, and Minnesota, there now are five schools of dental hygiene from which 125 to 150 hygienists graduate each year. At least twice as many hygienists graduating yearly will be required to furnish the personnel required to carry on continuing topical fluoride programs throughout this particular section of the country.

SUMMARY

Within a few months after Congress made funds available for a national sodium fluoride demonstration program, demonstration teams were assigned to several states in Federal Security Regions IV and V. These teams had two major functions. One, was to demonstrate to dentists, dental hygienists, local health officials and others, the approved technic for applying a 2 per cent solution of sodium fluoride to the teeth of children. The other function was to stimulate the establishment of local community fluoride programs so that the benefits of the decay preventive would be brought to as many children as possible.

States participating in the project have reacted favorably toward the demonstration program. It is believed that they will make every effort to assist their communities in developing local sodium fluoride programs.

The demonstration unit, since it is obligated to serve all geographic areas in a state, must limit the number of children it treats in a given community area. It remains for the local community to provide each child with this dental caries preventive measure.

Communities are eager to establish continuing topical fluoride projects, but the shortage of trained dental hygienists is seriously hampering the fulfillment of this ambition. All dental colleges in the two Federal Security Regions should be encouraged to establish schools for the training of dental hygienists. At present, with only 5 of the 11 dental schools providing such training, it will be impossible to meet the demand for dental hygienists.

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A Community's Action in Establishing a Topical Fluoride Program*

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THE reduction of new decay in teeth through the application of a solution of sodium fluoride applied directly to the tooth surfaces, has caught the imagination of parents everywhere as a safe and painless procedure. Ninety-five per cent of the population have dental defects, 35 per cent of all children have one or more decayed permanent teeth by the time they enter school, and 75 per cent of 16 year old children have lost one or more permanent teeth.

Regardless of whether people know these figures or not, from their personal experience they are interested in any workable method of reducing tooth decay and, particularly, in a safe, painless method. They are anxious to help their children avoid the dental difficulties they have themselves experienced.

The finding that a 2 per cent solution of sodium fluoride topically applied to the teeth of children will reduce new dental decay by 40 per cent is based on some 8 years of research with more than 15,000 children. The Congress of the United States appropriated funds for the Public Health Service to use in conducting demonstrations and information programs on this point, in coöperation with state health departments, dental societies, and interested organizations. The aim of programs was to provide the public with authoritative information and to inform dentists and dental hygienists on the approved application technic. It was hoped that communities —through dental societies and other organizations—would take action, with these helps, to shorten the usual lag in time between the research and the making of the benefits of sodium fluoride applications actually available to the people.

Editors of magazines having national circulation sensed the importance to the public of the Topical Fluoride Program, and in 1948 more than 12 magazines including *Colliers, Saturday Evening Post, Woman's Home Companion, Life, Harpers,* etc., ran popularly written stories under such titles as "Block that Toothache," "We'll Have Fewer Cavities Now," "The Simplest Health Program Ever Proposed," "How To Keep Away from the Dentist," etc.

In addition, numerous feature stories and short announcements were run in the daily and weekly press throughout the country. Professional magazines carried the news and described the technics involved and the methods of application.

This publicity with its enormous reader coverage on a subject—tooth decay—about which nearly every reader had acquired some information through personal experiences—whether toothache, shivers from the dentist's drill or the throbbing of a pain killer—caught the imagination of parents everywhere.

It was very evident that a major job such as the treating of all the children in a community the first year, and con-

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tinuing with treatments yearly for the 3, 7, 10, and 13 year olds required the coöperation of many groups, required some careful planning, and definite agreements on how it was to be done.

Suppose we step into a midwestern community—a county with four fair sized towns but no city. The editor of the local weekly newspaper read the magazine stories on sodium fluoride, talked to the county superintendent of schools about it, and then ran several articles in his paper on the subject. His response by phone and letter was very encouraging, indicating a definite interest. However, there appeared no unanimity of ideas on how the community might carry out such a program. The district health officer was called into a conference with the editor and the superintendent of schools. They decided to invite the suggestions of the County Dental Society, the Boards of Education, the Township Trustees, the County Commissioners, the Parent Teachers Association, the labor unions and the farm organizations. These organizations were asked to present their suggestions on how to proceed and how to finance the project. Their suggestions were to be presented and discussed at a meeting of all the groups, set far enough in advance to permit the various organizations to appoint a committee and to discuss the problem.

Some of the organizations requested more information. Available information was supplied in the form of news articles, reports, and two sound films—one on when and how teeth grow and the other on the application of sodium fluoride.

The Dental Division of the State Department of Health and the Dental Division of the Public Health Service were invited to be present at the meeting of representatives of the various groups to answer questions and to take part in the discussions.

There was about a 65 per cent attendance at this meeting. The editor was asked to serve as chairman. The discussion was very free and generally to the point. It was very evident that those present had a fairly good understanding of the problem. They were interested in combining with the topical application of sodium fluoride any other recommended methods of preventing tooth decay in order to gain maximum results from such procedures.

The committee from the Dental Society was the best informed and the most direct in its suggestions. Its members offered their assistance either through the dentist's private office or a school clinic. The Boards of Education representatives and the school superintendents were very practical in their suggestions and presented both the problems involved in a school clinic and the probable funds available per child.

The question of the cost of the program and the source of funds entered the discussion early.

In order to reach all of the children more readily with the least loss of time, it was decided to treat the children at the school during school hours. The dentists agreed to serve in the clinic at the school nearest their offices at a fee of $11 per hour and to furnish all needed supplies. The State Health Department agreed to supply needed portable dental equipment. The need for a dental hygienist, full time on the program, to support the local dentists was discussed favorably, but action deferred. The School Board representatives and the Township Trustees believed they collectively might raise sufficient funds the first year to approximate $4 per child of school age. They made it clear that each School Board and each Board of Trustees had power of independent action on such funds and could not delegate that authority. The regular meeting of the boards was discussed and assignments made for presenting the requirements for funds at the next meeting of each of these boards.

To help organize the program and get the 8 proposed school clinics started, a request was made to the State Department of Health to arrange for the Public Health Service Demonstration Team on Topical Fluoride to hold a regular demonstration in the county and continue its assistance for about 8 weeks.

Funds are now in sight, even though short of the goal, sufficient to justify starting the first year's program. The Topical Fluoride Demonstration Unit has been arranged for and a dental hygienist has been located but not as yet hired by the community.

Future action will be determined by the needs of furthering the program in the community as determined by the local committee. The use of school funds or the need for an increase in public health tax funds are being considered. In either case the public will be informed through reports to the various groups through their representatives and by the local press.

Nearly a year elapsed from the time local activity began until the first year's program was ready to start. It will require another year with all the dentists coöperating in rotation to staff the clinics in multiples of 3, to treat all the school children. The second and later year programs will treat the second, fifth, and eighth grade pupils every year. The clinics in those years can be staffed with one-third the number of operators, in order to treat each child every three years or as often as is required for average results.

Since people are learning how to proceed and whom to approach in order to obtain these services designed to reduce new tooth decay, a larger number of requests for the Sodium Fluoride Demonstration Unit are coming to the State Department of Health through the local health departments, with the recommendations of the county or district dental societies and other local organizations.

Parents in most communities are willing to put forth the necessary effort to organize their community for a dental public health program designed to reduce tooth decay. They visualize the use of fluorides, tooth brushing, and probably some diet variations as likely, not only to stop the advancing rate of tooth decay but to reduce the present rate of new tooth decay by 60 to 70 per cent.

Indications are that many communities are ready to move forward as rapidly as professional personnel becomes available to provide the services.

The finding that applications of sodium fluoride will reduce new tooth decay in children has caught the imagination of parents everywhere and they are ready for action.

The Newburgh-Kingston Caries Fluorine Study*

I. Dental Findings after Three Years of Water Fluoridation

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THE caries fluorine hypothesis which states that fluorine has a prophylactic effect on dental caries is supported by extensive epidemiological studies in this country and in other parts of the world.[1-8] These studies were made where potable waters contained fluorine naturally derived from the soil or rocks with which the waters were in contact. Data from animal experimentation and laboratory studies support the conclusions drawn from these investigations.[9-14] These conclusions indicate that there is an inverse relationship between the prevalence of dental caries and fluorine if the fluorine is ingested during the years of tooth development. It is also stated that when approximately 1 p.p.m. fluorine is ingested from natural fluoride containing waters during the years of tooth development we may expect to find about six times as many children showing no dental caries experience, as compared with children using fluoride-free waters; we may also expect to find about a 60 per cent lower dental caries experience rate, and about a 75 per cent decrease in first permanent molar loss. These benefits may be expected without the deleterious effects of mottling which results when higher concentrations of fluorine are present.

The reported studies to date have dealt principally with the mottling and caries prophylactic effects of fluorine when the latter is ingested from potable waters naturally containing fluorides.

In 1943 it was proposed to determine whether we can translate the conclusions derived from the epidemiological studies in fluoride areas to a practical application in fluoride-free areas where the communal water supplies may lend themselves to treatment. This plan proposed to test the caries fluorine hypothesis by increasing the nontoxic concentration of fluorine by adding sodium fluoride to the public drinking water supply of one community and using a comparable fluoride-free community as a control. In 1944 this suggested plan was made a reality when the cities of Newburgh and Kingston in New York State agreed to participate in such a program, as study and control areas respectively. This study was started in June, 1944, when basic dental examinations were begun. On May 2, 1945, sodium fluoride was added to Newburgh's water supply to bring its fluorine content up to 1.0–1.2 p.p.m., while Kingston's water supply remains fluorine-free. It is expected that the study will take 10–12 years to determine adequately the efficacy and safety

* Presented before the Dental Health Section of the American Public Health Association at the Seventy-seventh Annual Meeting in New York, N. Y., October 25, 1949.

of this caries prophylactic measure.[15-17]

Both cities are situated on the Hudson River about 30 miles apart. Each has a population of approximately 30,000. The climate of both cities is also similar, and their water supplies at the outset of this study were comparable and have remained so, except for the addition of sodium fluoride to Newburgh's supply.

SCOPE OF THIS REPORT

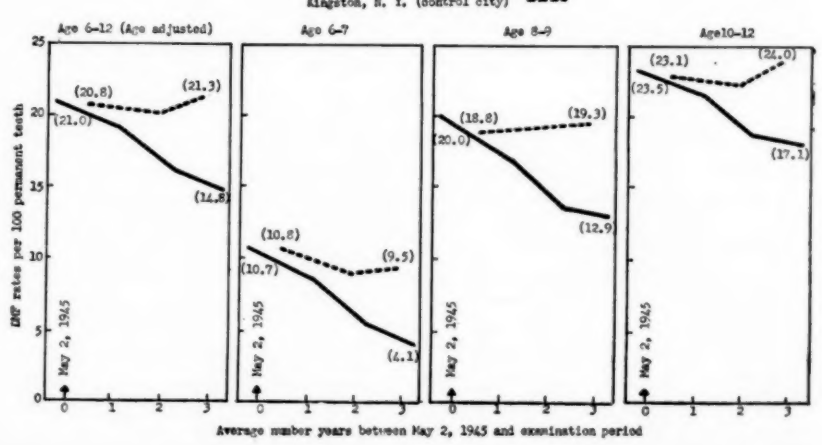
The tabulations and analysis of the data presented here represent a preliminary report based on comparisons of the dental caries experience in permanent teeth of all school children age 6–12 in Newburgh prior to the introduction of sodium fluoride into Newburgh's water supply and in Newburgh and Kingston for the following three years. In this report, in order to determine more accurately the trend, we are considering only those children age 6–12 who were in the original base study and who have had each successive examination until they reach age 12. Also included are new school children who entered the study at age 6 subsequent to the first examination and were present at each of the successive examinations. Thus, this study group will have only those children who we are assuming have had continuous residence in their respective cities. Approximately 3,400 children are included in the Newburgh data and 2,800 children are represented in the Kingston data.

All of the dental examinations in Newburgh and the first series in Kingston were made with mouth mirror and sharp explorer by the same examiner, one of the authors (S.B.F.). The subsequent examinations in Kingston using the same technic were made by two dental hygienists trained (by S.B.F.) in the method of examination and the charting of defects. In both areas the examiners called off the defects which were recorded by a staff clerk on a dental record card designed specifically for this study.

The findings of each tooth were indicated on the chart as caries-free, pit or fissure, which is not counted as a carious defect unless there is visual evidence of

Chart 1

TRENDS IN DMF RATES OF PERMANENT TEETH, 1944-1949



Date sodium fluoride introduced into Newburgh's water supply

TABLE 1

Per cent of Erupted Permanent Teeth with Caries[1] Experience

Children of School Age Examined at Periodic Intervals
Newburgh and Kingston, N. Y., 1944–1949

	Number of permanent teeth erupted				DMF rate per 100 teeth				
	Age[2] at each examination				Age[2] at each examination			Total	
Examination period	6–7	8–9	10–12	Total	6–7	8–9	10–12	Crude	Age[2] adj.
Newburgh									
June, 1944–May, 1945	3,579	7,937	24,586	36,102	10.7	20.0	23.5	21.4	21.0
Apr., 1946–Jan., 1947	3,466	6,746	20,592	30,804	8.9	16.9	21.9	19.4	19.3
Apr., 1947–Feb., 1948	3,533	6,679	16,942	27,154	5.5	13.5	18.7	15.7	16.0
Apr., 1948–Jan., 1949	4,057	6,642	15,645	26,344	4.1	12.9	17.1	14.1	14.8
Kingston									
Sept., 1945–Feb., 1946	3,631	6,904	21,221	31,756	10.8	18.8	23.1	20.8	20.8
Jan., 1947–Oct., 1947	3,534	7,185	18,147	28,866	9.2	19.1	22.4	20.0	20.1
Nov., 1947–Oct., 1948	4,617	6,699	16,317	27,633	9.5	19.3	24.0	20.4	21.3

[1] Caries experience includes teeth decayed, filled or missing (lost subsequent to eruption).
[2] Age at last birthday.
[3] Adjusted according to the age distribution of the permanent tooth population in the 1945–1946 Kingston examinations.

caries or if the explorer sinks into soft dentine, evident caries with involved surface noted, fillings present with surfaces noted, missing and unerupted teeth, and the presence of hypoplasia. There is also space for remarks for any unusual findings.

TREND IN DMF PERMANENT TEETH

The proportion of erupted permanent teeth with evidence of caries experience (decayed, missing, or filled) decreased in each successive examination period in Newburgh, from 21 per 100 before water fluoridation to 14.8 per 100 at the time of the last survey. The DMF rate per 100 teeth in Kingston remained approximately 21 for the three examination periods. The difference of 6.5 DMF per 100 teeth between Newburgh and Kingston at the last examination suggests a 30 per cent improvement in Newburgh. Chart 1 shows that this reduction in prevalence of caries in the permanent teeth in Newburgh as compared with Kingston was evident at each of the age groups.

TYPES OF TEETH

The difference in the caries prevalence in the two cities at the last survey periods also was observed for each of the different types of permanent teeth (Table 2).

TABLE 2

Prevalence of Caries[1] According to Type of Tooth

School Children Age 6 to 12 examined in
Newburgh (Apr., 1948–Jan., 1949) and Kingston (Nov., 1947–Oct., 1948)

		DMF rates per 100 teeth (Age adj.[2])		Difference	
Type of Tooth	Age at eruption years	Newburgh (Apr., 1948 –Jan., 1949)	Kingston (Nov., 1947 –Oct., 1948)	Absolute	Per cent of Kingston
1st molars	6–7	48.0	58.7	−10.7	−18.2
Anterior	6–9	4.5	9.9	− 5.4	−54.5
2nd biscuspids	10–12	5.8	9.5	− 3.7	−38.9
1st biscuspids	10–12	2.3	5.6	− 3.3	−58.9
Cuspids	9–12	0.3	1.2	− 0.9	−75.0

[1] Caries experience includes teeth decayed, filled or missing (lost subsequent to eruption).
[2] Adjusted according to the age distribution of the tooth population of each specified type in the 1945-1946 Kingston examination.

TABLE 3

Per cent of Erupted First Molars with Caries[1] Experience

Children of School Age Examined at Periodic Intervals
Newburgh and Kingston, N. Y., 1944–1949

	No. first molars erupted				DMF rate per 100 first molars				
	Age[2] at each exam.				Age[2] at each exam.			Total	
Examination period	6–7	8–9	10–12	Total	6–7	8–9	10–12	Crude	Age[3] Adj.
Newburgh									
June, 1944–May, 1945	1,607	2,369	4,483	8,459	23.3	57.3	76.4	61.0	58.9
Apr., 1946–Jan., 1947	1,552	2,026	3,766	7,344	19.7	51.5	77.9	58.3	58.1
Apr., 1947–Feb., 1948	1,568	2,010	3,093	6,671	12.6	42.6	70.9	48.7	50.3
Apr., 1948–Jan., 1949	1,818	2,055	2,875	6,748	9.1	39.3	68.7	43.7	48.0
Kingston									
Sept., 1945–Feb., 1946	1,641	2,166	3,931	7,738	23.5	53.8	75.1	58.2	58.2
Jan., 1947–Oct., 1947	1,618	2,199	3,379	7,196	19.7	54.3	76.5	57.0	58.0
Nov., 1947–Oct., 1948	2,132	2,066	3,052	7,250	19.8	52.5	78.7	53.9	58.7

[1] Caries experience includes teeth decayed, filled or missing (lost subsequent to eruption).
[2] Age at last birthday.
[3] Adjusted according to the age distribution of the 1st molar tooth population in the 1945–46 Kingston examinations.

The relative sizes of these differences varied considerably, however, according to type of tooth. The prevalence of caries in the first molars was 48.0 per 100 molars in Newburgh, or 18 per cent less than the rate of 58.7 in Kingston. The DMF rates of the incisor teeth which have approximately the same eruption ages as the first molars were 9.9 and 4.5 in Kingston and Newburgh, respectively, or 55 per cent less in Newburgh than in Kingston. A comparison of the relative difference of 18 per cent for the first molars with 55 per cent for the central and lateral incisors shows that artificially fluoridated water had the greatest prophylactic effect during the period of this study on the teeth least often attacked by caries. This also is shown by the inverse relationship between DMF rates and percentage reduction in DMF rates of the cuspids and first and second bicuspids. These observations are in agreement with those previously reported from areas served by naturally fluoridated waters.[2, 3]

The first molars, however, present the major part of the caries problem in grade school children. Approximately 60 per cent of the first molars of the children in the fluoride-free city were carious. This is 6 times the second highest rates of 9.9 and 9.5 per 100 incisors and bicuspid teeth, respectively. Therefore, the prevention of caries in the first molars is of utmost importance in any program for the control of caries in the school age group.

FIRST MOLARS

The DMF rates for the first molars in the last survey were 48.0 and 58.7 per 100 first molars in Newburgh and the control city, respectively, or an absolute reduction of 10.7 DMF per 100 molars during the 3 examination periods covered in this report (Table 3). This represents a relative saving of 18 per cent.

It is of interest to note that the trend in the DMF rates of the first molars was the same in Newburgh and Kingston during the first post-fluorine year of the study period (Chart 2). This suggests that there was little, if any, benefit to the first molars during the first year of water fluoridation. There was a notable departure from this trend in Newburgh, however, in the second and third years of water fluoridation with the result that there were 10.7 less DMF per 100 first molars in Newburgh than in Kingston in the last examination period.

Chart 2

TRENDS IN DMF RATES OF FIRST MOLARS OF SCHOOL CHILDREN 6 TO 12 YEARS OF AGE

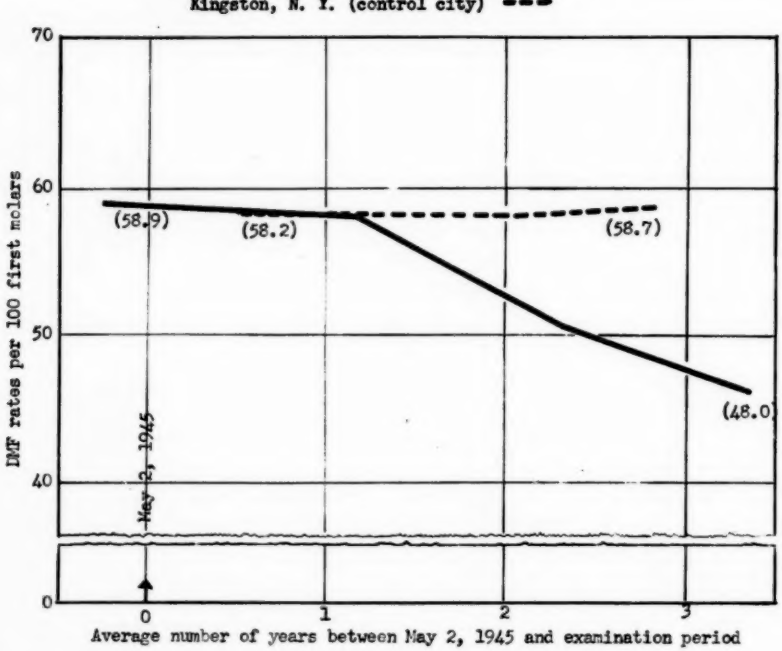


TABLE 4

Per cent of Erupted First Molars with Caries[1] Experience

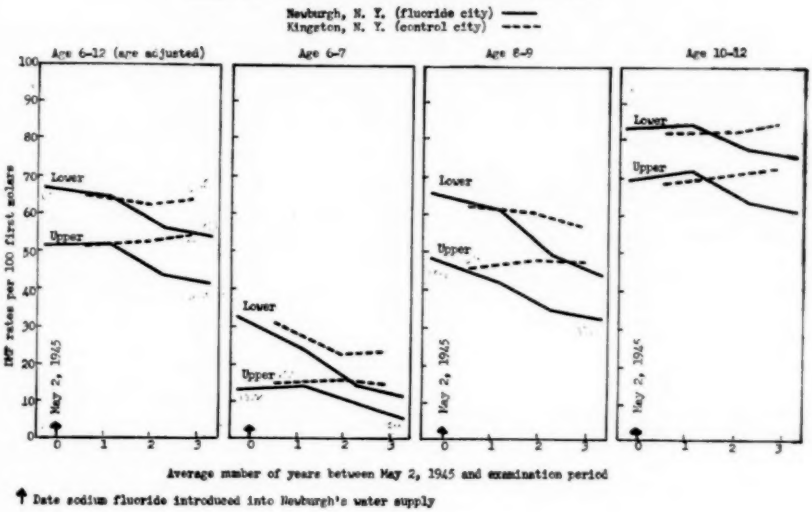
Children at School Age Examined at Periodic Intervals
Newburgh and Kingston, N. Y., 1944–1949

	DMF rate per 100 first molars									
	Upper					Lower				
	Age[2] at each examination			Total		Age[2] at each examination			Total	
City and examination period	6–7	8–9	10–12	Crude	Age[3] Adj.	6–7	8–9	10–12	Crude	Age[3] Adj.
Newburgh										
June, 1944–May, 1945	13.2	48.8	69.7	53.2	51.0	33.1	65.8	83.1	68.6	66.7
Apr., 1946–Jan., 1947	15.0	41.9	71.7	51.7	51.3	24.2	61.0	84.1	64.9	64.7
Apr., 1947–Feb., 1948	9.9	35.6	63.7	42.7	44.3	15.3	49.6	78.2	54.6	56.3
Apr., 1948–Jan., 1949	5.8	33.9	61.0	38.1	42.1	12.2	44.7	76.4	49.2	53.9
Kingston										
Sept., 1945–Feb., 1946	15.1	45.8	68.6	51.1	51.1	31.5	61.7	81.5	65.2	65.2
Jan., 1947–Oct., 1947	16.4	48.3	71.2	51.9	53.1	23.1	60.3	81.9	62.1	62.8
Nov., 1947–Oct., 1948	15.8	47.9	72.9	49.1	54.0	23.7	57.1	84.5	58.7	63.5

[1] Caries experience includes teeth decayed, filled or missing (lost subsequent to eruption).
[2] Age at last birthday.
[3] Adjusted according to the age distribution of the 1st molar tooth population in the 1945–1946 Kingston examinations.

Chart 3

TRENDS IN DMF RATES OF UPPER AND LOWER FIRST MOLARS, 1944-1949


Newburgh, N. Y. (fluoride city)
Kingston, N. Y. (control city)
Age 6-12 (age adjusted)
Age 6-7
Age 8-9
Age 10-12
DMF rates per 100 first molars
Lower
Upper
May 2, 1945
Average number of years between May 2, 1945 and examination period
Date sodium fluoride introduced into Newburgh's water supply

Both the prevalence of caries and the prophylactic effect of fluorine were different for the upper and lower first molars considered separately in the period covered by this report. At the initial examinations the prevalence rate in both cities was approximately 50 DMF per 100 upper first molars and 65 per 100 in the lower jaw (Table 4). In the last examination there was a decrease in Newburgh, as compared with Kingston, of 12 per 100 DMF upper first molars and 10 per 100 in the lower molars. The relative differences are 22 per cent in the upper and 15 per cent in the lower first molars. The relative difference in Newburgh as compared with Kingston was consistently larger in the upper first molars than in the lower first molars at each age (Chart 3).

Examining these data for the different age groups we note that in the upper jaw there is a difference of 10 per 100 DMF first molars at ages 6–7 in Newburgh as compared with Kingston with a relative decrease of 63 per cent. In the lower first molars this difference is 12 per 100 with a relative decrease of 49 per cent. At 8–9 years of age the difference for upper first molars is 14 per 100 with a relative decrease of 29 per cent while in the lower jaw it is 12 per 100 with a relative decrease of 22 per cent.

The first molars of the children age 6 and age 7 at the time of the last examination had had an average of 6 and 18 months of exposure to the risk of caries, respectively, during the period of water fluoridation covered by this report. The percentage differences in DMF rates at these ages were approximately 50 per cent as compared with somewhat smaller relative decreases among older children whose first molars had had longer periods of exposure (Table 5). Thus, the greatest protection to the first molars in this study, as well as in studies in natural fluoride areas, appears to have been in the younger age groups nearest to the age of eruption.

The decrease in DMF rates of the first molars of those age 6 at each examination period, as shown in Table 6 and

TABLE 5

Caries Experience (DMF)[1] of First Molars According to Age and Length of Exposure to Fluoridated Water

Newburgh, N. Y. (Apr. 1948–Jan. 1949)
Kingston, N. Y. (Nov. 1947–Oct. 1948)

Average age at examination		Newburgh (fluoride city), Apr., 1948–Jan., 1949				Kingston (control city) Nov. 1947–Oct. 1948	Difference in DMF rates of Newburgh and Kingston	
		Average age on May 2, 1945		Average exposure[2] of erupted teeth to fluoridated water	DMF rate per 100 1st molars	DMF rate per 100 1st molars		
years	months	years	months				Absolute	Per cent of Kingston
6	6	3	2	6 months	6.1	11.9	— 5.8	—48.7
7	6	4	2	18 "	12.3	26.3	—14.0	—53.2
8	6	5	2	30 "	30.9	42.7	—11.8	—27.6
9	6	6	2	40 "	48.5	61.9	—13.4	—21.6
10	6	7	2	40 "	61.2	75.4	—14.2	—18.8
11	6	8	2	40 "	67.2	79.0	—11.8	—14.9
12	6	9	2	40 "	79.7	82.9	— 3.2	— 3.9
Total—Crude rate		—	—	—	43.7	53.9	—10.2	—
Age adj.[3] rate		—	—	—	48.0	58.7	—10.7	—18.2

[1] DMF teeth are those decayed, filled or missing (lost subsequent to eruption).
[2] Based on age 6 as average age at which first molars erupt.
[3] Adjusted to the age distribution of the first molar tooth population in the 1945–46 Kingston examinations.

TABLE 6

Per cent of First Molars with Caries[1] Experience

Children of Ages 6–9 Examined at Periodic Intervals
Newburgh and Kingston, N. Y., 1944–1949

Examination period	DMF rate per 100 first molars Age[2] at each examination			
	6	7	8	9
Newburgh (fluoride city)				
June, 1944–May, 1945	16.2	28.4	45.2	66.3
Apr., 1946–Jan., 1947	11.3	26.5	47.1	55.4
Apr., 1947–Feb., 1948	6.3	16.2	34.1	51.0
Apr., 1948–Jan., 1949	6.1	12.3	30.9	48.5
Kingston (control city)				
Sept., 1945–Feb., 1946	14.6	30.0	48.4	60.7
Jan., 1947–Oct., 1947	11.3	26.7	44.9	63.2
Nov., 1947–Oct., 1948	11.9	26.3	42.7	61.9

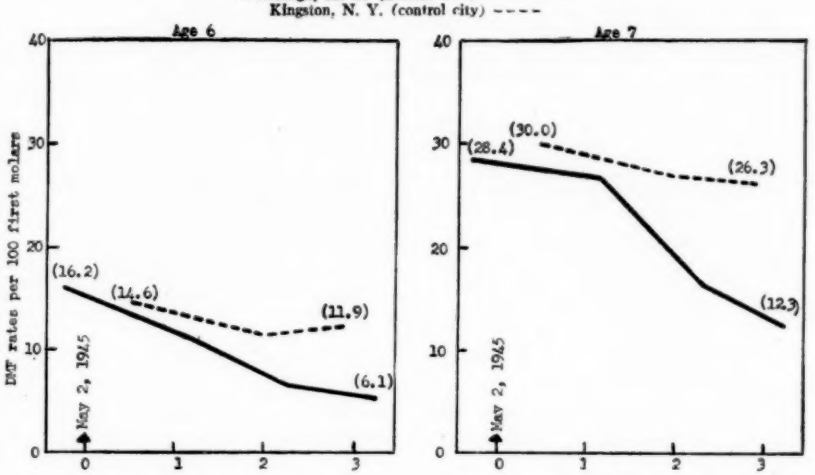
[1] Caries experience includes teeth decayed, filled or missing (lost subsequent to eruption).
[2] Age at last birthday.

Chart 4, suggests some interesting observations concerning the periods when fluorides ingested in potable water may be effective. The first molars examined at each survey supposedly had had the same length of post-eruption exposure to fluorine. Those examined in the last survey, however, had had a longer pre-eruption exposure than those examined in the third survey; similarly, those examined in the third survey had had a longer preëruption exposure than those examined in the second survey. This suggests that the continued downward trend at age 6 in Newburgh is due to the increased length of exposure in the period prior to tooth eruption. This preëruption exposure, however, is estimated to have begun at approximate average ages of 3, 4 and 5 for those age 6 in the fourth, third and second survey periods, respectively, or ages when the crowns of the first molars might be expected to be almost or completely calcified.

The benefits of fluorides ingested in

Chart 4

DMF RATES OF FIRST MOLARS OF SCHOOL CHILDREN
AGES 6 AND 7, 1944 - 1949
Newburgh, N. Y. (fluoride city) ————
Kingston, N. Y. (control city) - - - -



↑ Date sodium fluoride introduced into Newburgh's water supply

potable water during the period of tooth development prior to the completion of calcification have been reported by Dean.[1-5] Other observations reported by Klein and Deatherage have indicated the benefits of fluorides ingested in potable water during the post-eruptive period.[18, 19] Although other explanations cannot be entirely disregarded, the decreases shown in Chart 4 and apparently resulting from exposure to fluorine between the ages of 3 and 6 also may suggest the possibility of some benefit from the ingestion of fluoridated water in the period between calcification of the first molars and eruption.

SUMMARY

1. The DMF rate for permanent teeth shows a consistent downward trend in Newburgh from 21.0 to 14.8 per 100 permanent teeth. This indicates a saving of 6.5 permanent teeth per 100 in Newburgh as compared with a rate of 21.3 per 100 in Kingston at the last examination. This represents a saving of 30 per cent.

2. Among first molars, which account for the major part of the caries problem in children, after three years of fluoride experience, Newburgh's rate was 48.0 DMF per 100 first molars, while Kingston's was 58.7, or a difference of 10.7 DMF per 100 first molars. This represents a saving of 18 per cent in DMF first molars.

3. The greatest benefits are noted in the younger age groups.

4. The differences between Newburgh and Kingston as represented in these data suggest the possibility of benefits from exposure to fluoridated water subsequent to enamel calcification and subsequent to eruption of the first molars.

5. We cannot entirely rule out the possibility of variation in the interpretations of the examiners. The fact that more than one examiner was used might alter the differences between Newburgh and Kingston to some extent. However, the size of the differences in the DMF rates of the two cities is such that it is unlikely that an examiner bias could vitiate them.

6. These data are preliminary and it will be necessary to continue collecting data for the proposed duration of the study, that is, through 1954 to 1956, to obtain additional in-

formation concerning the caries prophylactic value of fluorine.

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Hospital Administration Course

The University of Pittsburgh Graduate School of Public Health has announced courses in hospital administration under a newly appointed Professor, Glidden L. Brooks, M.D., of Philadelphia, who will serve as Coordinator of the Medical Center Hospitals and Clinics.

Newburgh-Kingston Caries-Fluorine Study*

II. Pediatric Aspects—Preliminary Report

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EXTENSIVE epidemiological investigation has led to general acceptance of the inhibitory effect of naturally occurring fluoride in drinking water on the development of dental caries.[1] Acceptance of this concept has led to the planning and execution of long-term studies of the effect of artificial introduction of fluoride into communal water supplies. If the promise of such studies as the one at Newburgh and Kingston, reported upon at this session by Ast, Finn, and McCaffrey,[2] is borne out on more prolonged investigation, use of fluoride in communal water supplies may become a routine public health procedure affecting large segments of the population.

Before any public health procedure can be recommended for routine use, every effort should be made, within limits of available techniques, to ascertain the safety of the procedure in question. Although there is no acceptable evidence that naturally occurring fluoride in the concentration used in drinking water as a caries-deterrent, exerts any deleterious systemic effects, it is desirable to make carefully controlled observations of children receiving fluoride introduced into their drinking water, especially while it is still possible to do so before public clamor for routine use of fluoride precludes controlled studies. McClure[1] has stated this succinctly in a recent review, "Although further studies of population groups exposed to fluoride waters are undoubtedly desirable, it seems unlikely that prolonged ingestion of fluorine via a domestic drinking water containing 1.0 to 1.5 parts per million of fluorine, or perhaps more, presents a public health hazard."

At the time the Newburgh-Kingston Caries-Fluorine Study was being planned, possible toxic effects of fluoride were in the forefront of consideration, especially in view of certain unpublished reports regarding fluoride toxicity then in circulation which have not been verified subsequently. Planners of the project felt that a unique contribution could be made by including in the study a pediatric research clinic, utilizing laboratory and roentgenologic methods. Careful periodic evaluation was therefore instituted of a group of children in the city of Newburgh, receiving drinking water containing artificially introduced fluoride in a concentration of 1.2 p.p.m. of fluorine, and of a control group in the city of Kingston, the drinking water supply of which contains a negligible amount of fluoride. These two cities,

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about 30 miles apart on the west bank of the Hudson River, bore a close resemblance to each other in respect to size and socio-economic conditions.

METHODS OF STUDY

Initially a group of 500 children was chosen for study in each city. The age distribution of each group was about as follows: Under 1 year of age, 100; 1 year of age, 100; 2 to 5 years of age, 200; and 5 to 9 years of age, 100. During each of the first 3 years of the study an additional group of infants under 1 year of age was enrolled in the pediatric research clinic in each city. The sexes were equally represented at each age in so far as possible.

An effort was made to select the children in proportion to the population in various parts of each city, concentrating upon enrollment of children from families which might reasonably be expected to remain for the duration of the study. Attention was also paid to obtaining a comparable selection of children in each city according to socio-economic status. This was not entirely possible because of the voluntary nature of the examinations.

The same research clinic team conducts the medical examinations in both cities. The physical examinations are performed by a board-qualified pediatrician (D.E.O.) who also directs the work of an experienced public health nurse, a laboratory technician, and a clerk receptionist.

A careful medical history is taken at the time of each child's initial visit to the research clinic and the history is supplemented at each annual visit. A physical examination is performed annually, with special emphasis placed upon tissues and organs which have been mentioned as possibly affected by fluoride. Thus, special attention has been paid to oiliness or dryness of the skin, to skin turgor, to abnormal markings or brittleness of the nails. Physical measurements made at each visit consist of weight, standing and sitting height, circumference of head and circumference of chest.

In Newburgh the following laboratory examinations are performed at each visit: routine urine analysis, hemoglobin, total leucocyte count, and total erythrocyte count. If the total leucocyte count is outside the range of 5,000–10,000 per cu. mm., a differential leucocyte count is also made. These examinations were also made in Kingston during the first three years of the study. If any deviations are observed from the base line observations in Newburgh, the laboratory examinations will be resumed in the control city.

Roentgen films are taken of the right wrist and both knees of each child at annual intervals. These films are read by Dr. John Caffey, professor of clinical pediatrics at the College of Physicians and Surgeons, Columbia University. Special attention is paid to any possible change in bone density in view of the occurrence of osteosclerosis in chronic fluoride intoxication.

Certain special examinations are made of small groups of children in Newburgh. A group of 25 children of various ages, selected from those enrolled at the pediatric research clinic, has been given special ophthalmological examinations, including mapping of visual fields and determination of transparency of cornea and lens. The same group of 25 children has received special otological examinations including audiometric tests. Special examinations on selected groups of children will be repeated annually. If any pathological trend becomes evident in Newburgh, similar examinations will be performed in Kingston for control purposes.

Other special studies are being conducted or planned to answer special questions in connection with the Newburgh-Kingston study. A study is well under way, in coöperation with Barnett and McNamara at the New York Hos-

pital in New York City, to determine the mode of excretion of fluoride in the urine of children having impaired renal function compared with a group of children of the same age with normal renal function. Another study being planned will attempt to utilize objective quantitative methods for the determination of bone density of children in Newburgh and Kingston.

RESULTS

Comparison of the results of the medical examinations of children in the two cities at the time of the introduction of fluoride into the Newburgh drinking water supply and three years afterward, and between the children in Newburgh during the same interval, has failed to disclose any significant deviation in any of the factors studied.

After careful study of the roentgen films, Dr. Caffey found no detectable difference in bone density in children in the two cities studied. Dr. Caffey also found both groups of children to be within the normal range of skeletal maturation on clinical estimation.

No abnormalities have been found in the visual field and no opacities have been discovered in the cornea or lens of the children given special ophthalmological examinations. Similarly audiometric tests, as part of the special otological examinations, have given results within the range of normal hearing for the ages studied.

The results thus far in the study have disclosed no deleterious systemic effects from the ingestion of fluoride in drinking water in the dosage employed. It must be emphasized, however, that a longer period of observation is required before final conclusions can be drawn. The possibility of demonstrating cumulative effects of fluoride in the final years of the 10 year study cannot be eliminated at this time. More refined techniques may also be available in the future in studying pertinent aspects of the problem.

SUMMARY AND CONCLUSIONS

1. The preliminary results of the pediatric examinations at the start and 3 years after introduction of fluoride at the Newburgh-Kingston caries-fluorine study are reported.

2. Special examinations, including physical examinations, laboratory tests, and roentgen studies, fail to disclose any significant deviations in any of the factors studied in groups of children ingesting fluoride as compared with a control group.

3. Final conclusions regarding the possible systemic effects of fluoride in the dosage employed should not be drawn before termination of the 10 year study.

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Baltimore's Medical Care Program*

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THE Baltimore City Medical Care Program is an integral administrative part of the Baltimore City Health Department. It is a lusty infant that was born on June 16, 1948. With its 5 year old brother, which serves the 23 counties of our state, it rounds out the Maryland Medical Care Program. The rural part of this work has been described in earlier papers by Dr. Robert H. Riley [1] and Dr. Dean Roberts.[2] The entire work, city and rural, was established as a result of the initiative taken by the Medical and Chirurgical Faculty of Maryland, our venerable state medical society. There is already a considerable bibliography [3] on the origins and progress of the Baltimore City program which is financed almost entirely by state appropriations. These funds are allocated to the Mayor and City Council in accordance with special statutory provisions enacted by the State Legislature in 1947.

The Baltimore City work differs from that in the counties chiefly in three ways. In the city, (1) specially organized medical care outpatient clinics in hospitals are paid by the City Health Department, under contract, on a per capita basis, $10 per year, for each of the 26,000-odd persons receiving public assistance from the City Welfare Department. (2) Private physicians, often those who have no hospital privileges, and who may work and consult with these new medical care clinics, are paid $7 per capita per year by the City Health Department to give home and office care to these same persons, whether they are sick or well. In contrast, in the counties of Maryland payment to physicians for the care of the sick is on a fee for service basis. (3) So far, in Baltimore, the program is limited to persons receiving public assistance, whereas in the counties, in addition to serving such persons, about one-third of the funds now being spent go for the medical care of medically indigent persons, not poor enough to receive public assistance.

In Baltimore, following the county pattern, approved drug bills for persons within the program are paid directly by the Health Department to the neighborhood druggist. In the city program every effort has been made to minimize paper work. The punch card is much in evidence. The family doctor even has begun to use such cards that are designed to serve as quarterly reports of the service he has rendered to each of the persons who have chosen to be under his care. All preventive and clinic services made available to the community by the City Health Department, such as well baby clinics, chest clinics, or venereal disease clinics, are used and integrated in the medical care program wherever this is applicable. Thus, in Baltimore City the plan is to keep the well person well, and to restore health to the ailing at the earliest opportunity. All this is on a clinic or home and office basis. The new program has established no change in earlier methods of securing needed hospital care.

Five hospitals, including the two medical school hospitals in the city,

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have so far established and conduct special medical care clinics for us. Each clinic has a medical director and other needed staff. The recipients of the service are allocated in general to the medical care clinic nearest them. Each person, shortly after reporting to the clinic, receives a complete physical check-up and selects a personal neighborhood physician for follow-up home or office care. The clinic notifies the family physician that he has been chosen and sends him a written report of the physical findings.

About 235 private physicians are now working in this way with the five medical care clinics. Some take very few cases such as those who were formerly their patients. Some prefer not to take former patients. Others take in the neighborhood of 300 persons, and, in the exceptional case, to meet a shortage of available Negro physicians at our request, two physicians have agreed to take 1,000 persons each, and already have over 650 each on their lists. Some of these physicians are so enthusiastic about the opportunities of the new program and are such good workers that they have been asked to serve as part-time clinic physicians on the medical care clinic staff. In general, their interest was slow in developing, but that was natural because of the unusual character of the new relationships.

In this connection it may be said that there are at least three important aspects of this new teamwork. First, the hospital contracts with the city to provide and have readily available within the hospital, consultation services in the fields of medicine, surgery, obstetrics, pediatrics, chest, eye, ear, nose and throat, gynecology, orthopedics, dermatology, genitourinary disease, psychiatry and neurology, dentistry and radiology, and clinical laboratory facilities; and contracts further to provide these consultation services for any recipient of public assistance upon the request of the personal physician chosen by that person. Second, the hospital may gradually see itself in a new light as a community member with expanded extramural responsibilities and opportunities for continuing to make available new medical knowledge to those physicians who have elected to become associated in this way with a new and vital teaching process. And third, the provisions of the city program require that any physician duly licensed to practise medicine in the State of Maryland who desires to participate in providing this home and office medical care to persons receiving public assistance shall at his request have his name placed on the list of physicians kept for this purpose at each medical care clinic. These three elements, and related parts of the program, should mean that better medical service will be available to the people of the city.

Of the 26,000 persons receiving public assistance and therefore eligible for this medical care in Baltimore City, the largest group, roughly 15,000 receive aid to dependent children. About 5,000 each are in two groups: those receiving old age assistance and those on general public assistance; and a small group of about 300, receive aid because of blindness. About two-thirds of the entire group are Negroes as compared with a 20 per cent colored population in the city as a whole. To October 1, 1949, the City Health Department has notified a total of 19,568 eligible persons to report to the medical care clinics and as of that date, 14,651, or 74.9 per cent, have registered.

In addition to the basic $17 annual cost per person served, that is $10 to the hospital medical care clinic and $7 to the personal physician, our experience to date indicates that the annual drug bill per year is $3.20 per person. At present, 227 druggists in the city are being paid and the last monthly bill was $5,505 for these drugs. The figure includes moneys paid to hospital dispen-

saries for like drug services. There is also $1 allowed to each hospital having a medical care clinic for emergency dental work per person per year, and administration is figured at $1.70 annually per person. These items together give an average total cost of $22.90 per year per person.

It may be said that the Baltimore City Health Department is enthusiastic about its new responsibilities in the field of administering a curative medical program not related entirely to the communicable diseases. The Health Department has been most fortunate in the professional leadership which drew the plans for the basic structure of the Baltimore City Medical Care Program and in the professional and lay endorsement and support that it has received so far. It also owes very much to the high quality of the physicians available to direct the new Medical Care Section in the City Health Department and to direct the five new medical care clinics in the hospitals. The teamwork is excellent.

While there is a mass of administrative detail that has been given the most careful attention by the architects who designed the Baltimore City Medical Care Program, it is not intended to present this detail here. It may be said that the breadth and depth of what can develop out of the program in Baltimore are due largely to two great leaders, Dr. Maurice C. Pincoffs, Chairman of the Medical Care Committee of the Maryland State Planning Commission, and Dr. Lowell J. Reed who served as Chairman of the Baltimore City Medical Care Committee. In this work in Baltimore we are exploring uncharted seas. There are still fog-banks and land-falls ahead, such as the matters of the need of greater appropriations to permit extending the service to medically indigent groups not receiving public assistance, the apparent need in our city for more Negro physicians who will participate in the work, and the need to integrate the new program closely with other and older types of tax-supported medical and hospital care. However, provision has been made within the City Health Department for a careful statistical analysis of current activities and results that should help in mapping the course for the future.

The Baltimore City Health Department is particularly happy that the medical profession saw fit to suggest and plan the new Medical Care Program and to stand by at its christening. On this occasion the City Medical Society added its blessing and in the closing words of its Resolution of Approval exhorted the physicians of Baltimore to make the new program successful "in the best interests of the people of the City."

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Education in Industrial Medicine*

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ANYONE who proposes a program in the field of medical education today must be realistic. The deans of medical schools have been, for a long time, harassed by the fullness of the undergraduate medical curriculum and the demand for the introduction of more topics into the course. Consequently, all that can be expected is a reasonable number of hours of instruction sufficient to indoctrinate and orient medical students in industrial medicine which most of them have never thought of as a specialty in medicine. A recent survey by Dr. E. W. Brown of the Council on Industrial Medicine of the A.M.A. showed an average of 12 to 14 hours of instruction allotted to industrial medicine in a number of medical schools, usually during the third or fourth year course. This amount of time should be adequate to give the student a comprehension of scope and purpose of industrial medicine.

As with other medical specialties, education in industrial medicine falls into the graduate category. The situation is one of newness and there is a degree of variance in viewpoint that will not be cleared up in a hurry — which is just as well. However, several medical schools have started graduate courses in industrial medicine ranging from one to three years in extent, and these courses are actually under way. The three year courses lead to the degree of Doctor of Medical Science in Industrial Medicine and the one year course to Master of Science in Industrial Medicine. It is too early to say which type of course is most applicable to existing needs, but it seems probable that both will meet certain definite needs.

Industrial medicine involves the application of two skills — medicine and engineering; it is concerned with the environment of the industrial worker as well as with the effects of that environment upon his physcial and mental structure. These two skills are equally essential and no program which does not include their coördinated activity will be effective.

It is important, therefore, that a definite amount of basic instruction be given to the physician student and the engineer student jointly. The physician does not become an engineer and the engineer does not become a physician, but each must have a fair comprehension of what the other does and why. Recent years have seen a great increase in the impact of engineering upon medicine. The circumstances under which these two professions must work together are constantly increasing. If the physician and the engineer can have some of their basic training together it will be much easier for them to work together.

The physician who lacks specialized training can enter industry and in several years become fairly proficient in his specialty if he has energy and the requisite degree of mental curiosity. He acquires his proficiency at the expense of the workers he is supposed to supervise and of whoever pays his salary. That is not a system that is regarded with approbation in other branches of

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medicine and it has become outmoded in industrial medicine.

The industrial physician is concerned with occupational diseases, occupational injuries, preventive medicine, and administration, including the maintenance as well as the utilization of records, and the function of industrial nursing. We must also add to the foregoing the peculiar hazards of radiant energy. It should be noted that increasing emphasis is being placed upon the preventive aspects of the physician's work. In addition there are certain related subjects which are of utmost importance as well as of increasing complexity in both their scope and administration. In this second group are included the following:

1. Workmen's compensation and also the application of insurance principles to benefits for non-occupational injury and sickness, including hospitalization and dependency benefits. Both the full-time industrial physician and the part-time physician need to be thoroughly conversant with both the occupational and non-occupational types of benefit. In every instance these benefits cannot become operative, as far as the individual worker is concerned, without the physician's signature. The expansion of both occupational and non-occupational benefits marks one of the great social advances of our times and the physician who comes into contact with these laws and contracts needs to be conversant with both their content and underlying philosophy.

2. Rehabilitation, which is at last beginning to come into its own. Included here are not only the rehabilitation of those maimed by accident but also those suffering from organic disease — the diabetic and the cardiac and hypertension cases.

3. Geriatrics and its application to the needs of the workers in the older age groups. Here is a challenge to the industrial physician which is becoming more emphatic with every passing year.

4. Psychiatry — the application of psychiatric technics in recognizing and dealing with emotional conflicts among industrial workers. As has been expressed on more than one occasion, we do not need a psychiatrist in every industrial plant, but we do need psychiatry in industry.

These four subdivisions are included in what may properly be termed social medicine. These social aspects of medical practice are particularly important in industrial medicine as is evident to anyone who is familiar with current events and trends.

Underlying a course of graduate instruction such as has been outlined, there should be a foundation of research in the fields of toxicology, physiology, and industrial hygiene. This latter term is used in its commonly accepted connotation, namely, the engineering analysis and control of the working environment. I referred in the beginning of this discussion to graduate courses that are now being given or are about to be initiated. It is neither necessary nor desirable that they resemble one another too closely, but all are based upon the concept of instruction, field work, in-plant training, and participation in research projects.

All this may seem ambitious and time consuming; nevertheless what has been outlined here represents a standard of education in a branch of medicine which must be accepted if wage earners, the community, and industry are to be adequately served. It must be constantly kept in mind that you cannot maintain a vacuum. If adequately trained physicians and engineers are not available to fulfil these needs then unqualified persons will slip in to deal with them.

You sometimes hear the expression that industrial medicine is the medicine of the future. It is in fact the medicine of today, and herein lies a responsibility which medicine and engineering, industry and labor must face.

Proposed Report on Educational Qualifications of Medical Administrators of Specialized Health Activities*†

Foreword

Five years ago the Governing Council approved a report [1] submitted by the Committee on Professional Education on this subject, which covered the qualifications of medical administrators of:

Maternal and Child Health
Tuberculosis Control
Venereal Disease Control
Cancer Control
Mental Hygiene
Industrial Hygiene

Within a year the Committee on Professional Education handed the report to a referee for revision of the previous recommendations and, in addition, to include the control of the acute communicable diseases among such specialized services.

The referee submitted a revision at a meeting of the committee in January, 1946. He expressed dissatisfaction with his report and, after some discussion, it was decided to appoint several subcommittees to draft separately qualifications for medical administrators for each of the specialized activities covered. Attempts to produce acceptable separate recommendations were not successful. and at its meeting in April, 1948, the committee decided to attempt once more to revise the inclusive report covering the seven specialized services mentioned above.

The reason for doing so was in the main the recognition that there existed a difference of opinion, sometimes strongly felt, among professional public health workers as to the relative emphasis to be given to education and training in general public health and to education and training in the specialized field. A clear-cut expression of opinion by the Committee on Professional Education and the American Public Health Association on this question was much needed. Another consideration was the recognition that certain qualifications were common to all administrators of specialized services, and that much repetition could be avoided in an inclusive report.

The existence of the difference of opinion above noted is the reason for presenting this foreword. This is done in order to set forth the committee's conception of the duties of a medical administrator in a specialized service and the reasons for emphasizing administrative ability rather than clinical specialization as the primary need. There is no argument as to the acceptability of the physician who has qualified for a specialty board (or has an equivalent training testifying specialized clinical proficiency) *and who also has successfully completed* an accredited course in public health, including satisfactory field experience. The question arises when something less than this is offered which

* The Committee on Professional Education of the American Public Health Association publishes this report before transmittal to the Governing Council in order to permit the members and Fellows of the Association to review it and to offer criticisms and suggestions in the further consideration of the report.

This report, like all other statements of the committee on professional and technical qualifications in public health, is subject to periodic revision in order that it may be kept abreast of the best thought.

† This proposed report is a revision of the Report on the Educational Qualifications of Medical Administrators of Specialized Health Activities approved by the Governing Council on October 4, 1944.

is the case in the vast majority of applicants for these positions.

As the chairman of the committee on Professional Education stated 3 years ago,[2] "Realism demands we face certain important facts in this question. The first is that there has always been a dearth of well trained people in the public health field. . . . Insistence on prolonged postgraduate training will not help this serious situation."

The existing difference of opinion arises from differences as to the duties of the administrator of a specialized service and the needs of the service of the health department as a whole in respect of the specialized services, and the kind of training best suited to fit a physician to perform those duties.

The previous published report[1] of the committee included, among the duties of the administrator of a specialized service, "participation in clinical activities in greater or less degree depending upon the size of the medical staff. Even in large organizations, he serves as a consultant (presumably a clinical consultant on difficult cases), and in smaller agencies he serves as a clinician and takes part in diagnostic and treatment activities."

The above concept is rather widely held among physicians in practice, specialized administrators themselves, and formerly was among health officers. It has a certain validity in departments of health serving sparsely populated areas in which physicians practising the specialties of medicine are few or remote, and possibly it has in the initial or introductory phase of a newly established specialized service.

In the first of the two circumstances mentioned above, it is doubtful that the term "medical administrator" (or a comparable term such as "division or bureau director") is applicable to the head of the service. They have few, if any, field or office personnel to direct, and their function is mainly to supply service directly to the individual. They are frequently given administrative titles in order to justify a higher salary than a title which more accurately indicates the work they are expected to do.

The introductory phase of a newly created specialized service in a larger organization also frequently begins with the establishment of clinics in the areas least adequately served as "demonstrations" intended to show needs, benefits, and methods of operation. This phase includes an estimate of the quality of the services being rendered by existing facilities, their needs in equipment and personnel and, if funds and policy permit, recommending the amount of subsidies and the conditions under which they should be granted. This stage also involves explaining to the medical profession the purposes and proposals of the new activity.

It is no doubt true that physicians in charge of clinics and practitioners in general listen more kindly to comments made by a physician trained in his specialized field. It is a rather common human trait. The dairy farmer is more likely to respect a milk inspector who can talk intelligently about herd management, lines of breeding, etc., than one proficient solely in how to produce safe milk. It gives the dairyman a way of judging the soundness of the inspector's recommendations.

It is also true, however, that after the establishment of a number of local direct service facilities of suitable quality, and the general acceptance of the program in the expanded and probably still expanding operations of a specialized service, the job of maintaining quality, of increasing quantity, of measuring results, of estimating future needs and planning for them, etc., calls for administrative talents which may or may not be possessed by a specialist in some branch of medicine. This is much too often left out of consideration or underweighted in examinations for medical

specialists for an administrative position under Civil Service or other Merit System. It is also largely ignored, certainly under-emphasized, in the report previously submitted by this committee.[1] The result is that a good clinician who lacks administrative talent is more or less permanently settled in a position for which he has neither aptitude nor liking.

It is the opinion of the Comittee on Professional Education that except in smaller health departments no clinical duties should be *required* of a medical administrator, and that his clinical services, if any, should be limited to such as receive explicit sanction from the head of the department. The clinical work should be entirely, or almost entirely, performed by full-time or part-time physicians with the appropriate clinical qualifications.

The second area of disagreement is that relating to the kind and amount of training in general public health work needed to qualify as the administrator of a specialized service. It has been mentioned that the needs of the services of the health department as a whole are a consideration in the mind of the health officer in choosing an administrator of a specialized service. He wants this service to make legitimate use of the other bureaus and divisions of the department, and he wants the facilities of the specialized division to be available, within reasonable limits, of course, to other divisions. He wants interchange of ideas as to objectives and methods. He wants, as much as possible, to achieve a cumulative effect from the work of the department without in any way hampering exceptional performance, unless this is at the expense of other divisions of the department. He emphatically does not want a sequestered division.

These considerations call for a good understanding of public health work as a whole. This can be obtained through the successful completion of an accredited course in public health or through experience in a health department, provided thoughtful attention is given to gaining it. This attention is important and requires conscious effort. It will not be acquired through the casual association incident to employment as a specialist with the attention centered almost exclusively on the specialty.

When it comes to the specific duties of the administrator of a specialized service in a large health department (which are hereafter listed in the report) it will be found that they can all be classed as administrative and that none of them require the prolonged clinical training of a clinical specialist. While their performance may be enhanced by the possession of such training, it may also be hampered through habits of thinking too deeply ingrained to change.

The overall objective of the administrator of a specialized activity is to assist *all* the people in need of this service within his jurisdiction. He has to get other people — many of them — to give the actual service to the people needing it rather than doing it himself.

The aim is to sustain that which is excellent, make excellent what is good, good what is fair, and establish something at least fair where there is nothing. This involves continuing effort, measuring, recording, trial and error, adapting, statistical interpretation, etc., which lie in the field of administration rather than clinical medicine. This requires something more than a short course of less than a scholastic year in a school of public health, or the services of a secretary and statistical clerk in lieu thereof. It involves a knowledge of statistics, at least to the point of being able to interpret them and to recognize common errors, and sources of error, of epidemiological methods and of public administration, particularly public health administration.

While there are clinicians, as well as scientists and laymen, who have a grasp of the art of administration without having had either formal training or extensive experience, it is by no means a prevalent gift. Much of the confusion of the early days of the New Deal and the antagonisms aroused by foolish and conflicting regulations have been attributed by students of administration to a failure to recognize this fact in appointing the heads of the new administrative agencies. The starry-eyed enthusiasts and uninhibited experts are no substitute for the competent administrator. Dr. Dodds, President of Princeton, said in an address to guests of the Milbank Memorial Fund in 1943[3]: "Being an expert is apt to be heady wine. When combined with the power of government, it can become intoxicating spirits."

The past chairman of the Committee on Professional Education, in the article previously referred to,[2] asks the pertinent question, using the director of a division of maternal and child health as an example: "Is he essentially an obstetrician, pediatrician, or public health specialist?" The idea that special training in *either* obstetrics or pediatrics is suitable clinical qualification for this position is incongruous with the idea that specialized clinical training of a high order is essential to the competent direction of a specialized service in a health department. There is much in each of the above specialties that is not included in the other. Their common interest in the development of the human embryo is merely an attempt to rationalize a custom. Consistency would demand either that they be organized as separate services or that the director be proficient in both specialties.

In the above quoted article it was concluded that ". . . the average physician in public health is essentially a medical administrator with a thorough knowledge of the mass phenomena of disease prevention and health promotion. . . ." Whether or not we agree as to the thoroughness of his knowledge, it must be conceded that the duties of all full-time health officers, their deputies, their division and bureau directors and assistant directors are essentially administrative and demand competent administrators to obtain the maximum benefits. It seems probable that a considerable majority of the physicians employed full time in public health work are appointed under one of the above titles or one closely similar and are engaged, or should be engaged, in performing administrative duties. That being the case, the primary object, in so far as medical personnel is concerned, of schools of public health, of heads of the larger health departments, and of directors of training centers should be to educate and develop medical administrators.

There are a number of reasons why this has not been done, or very well done, in the past, and for the low opinion of administration held by so many people. Among the reasons for this low opinion are that so much administration has not been very good because it has been performed by novices in the art, and that administrators not infrequently indulge in bombastic publicity and have to have unseemly associations with politicians and sometimes fail to follow the advice of the expert. None of these is necessarily true except possibly the last.

Brooks Adams[4] has defined administration as "the capacity of coördinating many, and often conflicting, energies in a single organism, so adroitly that they shall operate as a unity. This presupposes a power of recognizing a series of relations between numerous social interests with all of which no man can be intimately acquainted . . . it is possibly the highest faculty of the human mind."

That seems rather high-powered and probably a cut or two higher than the

requirements of the average health officer or division head. If administration is defined as the "art of obtaining the coöperation and coördination of a number of people in the systematic application of knowledge and skill to effect a desired result," it will suffice without being overpowered. However, it does indicate that it is not the simple nor unimportant thing that so many seem to think it is. As Dr. Dodds says "it is indispensable if the findings of science are to be made effective through government."

He goes on to add that Americans have "been even more reluctant to recognize the need for the education of its officers in public administration than in the science or techniques which government utilizes," and this fault is perhaps more common in the public health than in any other field of government. It is a condition that needs correction, both in practice and habits of thought, without at the same time making expertness in administration an end in itself, without losing sight of the values its exercise is designed to bring about and the further values that may lie beyond our immediate horizons. There must be a heart as well as a head.

In accordance with the doctrine implied in the foregoing, it is recommended that the education and training of administrators and assistant administrators of specialized services be essentially those recommended for health officers, with the proviso that at least one year of experience in generalized public health work follow completion of the graduate public health course. It is recommended that training in the specialized activity follow, rather than precede, experience in general health work, and that ways be developed to provide such specialized training to the extent experience shows it to be necessary; that this specialized training not attempt to qualify the individual as a clinical specialist; that recruitment be to the lowest administrative grade in the specialized service, be from the generalized service (health officers, deputy health officers, etc.) and that administrators in specialized services be eligible for advancement in generalized service.

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EDUCATIONAL QUALIFICATIONS OF ADMINISTRATORS OF SPECIALIZED HEALTH ACTIVITIES

Cancer Control
Communicable Disease Control
Industrial Hygiene
Maternal and Child Health
Mental Hygiene
Tuberculosis Control
Venereal Disease Control

General Scope

The Specialized Activities included in this report are those activities of the health department which are designed to control individual diseases or groups of diseases, and to safeguard and promote the health of selected population groups. All of them are concerned with the wide scale application of specialized medical knowledge and they require the use of a number of other facilities of the health department and of the communities they serve.

Some of them have been organized as separate units of larger health departments for 20 years or more, while others are of recent establishment. The earlier established ones have developed recognized techniques and have records of accomplishment which have reflected great credit upon public health work as

a whole. Those of recent origin have yet to work out methods of operation, their effects are less susceptible to measurement and their tangible benefits, if any, are as yet vestigial.

Functions

The duties of the administrators of specialized services are the performance of the functions enumerated or includable in one of the categories of the following list:

1. Ascertain existing problems including needs and facilities for meeting them.
2. Develop policy, plans, and procedures.
3. Estimate required personnel and budget.
4. Draft laws and regulations including revisions of existing ones.
5. Devise methods of measurement.
6. Measure and interpret results at suitable intervals.
7. Recruit and direct professional and auxiliary personnel.
8. Direct inservice training.
9. Select advisory committee.
10. Adapt technical advances in diagnosis and treatment to the objectives.
11. Conduct or develop public education in respect to the service.
12. Obtain the coöperation of other divisions of the department, allied divisions in other branches of the government, voluntary health associations, and the medical profession.
13. Provide the medical profession, in suitable ways, with information regarding new advances in diagnosis and treatment.
14. Establish and promote clinics for immunization, diagnosis, advice, and for treatment.
15. Establish and maintain suitable standards of professional quality, record keeping and environment in clinics operated or assisted by the department.

These duties may be spelled out in greater detail for each of the services. There will be variations in the relative importance to be attached to each in accordance with the needs of a specific service. These duties are administrative rather than clinical in their nature, and the recommended lines of promotion and qualifications of the head of the service are in accordance with this conception.

In large local health departments and in state and federal health agencies there are a number of subordinate medical positions the duties of which are wholly or primarily of administration. The incumbents may be engaged in generalized health work, as deputy or assistant, or district or asistant district health officers, or assistant directors of a division, all of whom should be considered as in line of promotion. So also should clinical consultants who have had some administrative experience and demonstrated aptitude in administration, and health officers who have developed an exceptionally good service in the field under consideration. The heads of specialized services and their assistants should likewise be considered for promotions in the generalized services.

Broad Educational Background

The basic qualifications for medical administrators of specialized services should be as follows:

1. Fundamentals in the sciences and humanities at least equivalent to those required for a college degree in the arts or sciences.
2. Completion of a course leading to the degree of Doctor of Medicine in a medical school approved by the Council on Medical Education and Hospitals of the American Medical Association, or graduation from a foreign medical school of recognized standing.
3. Internship of at least one year in an approved general hospital, preferably one including a service corresponding to the specialized service under consideration.
4. Eligibility for medical licensure in the state where service is to be rendered.

Graduate Education

Graduate education and training for administrators of specialized services should include the following:

1. Preliminary supervised field training in a well organized health department for a period sufficient to give acquaintance with the general aspects of public health and to give the candidate an opportunity to determine his own liking and fitness for such work.

2. Completion of a program of study of not less than one full academic year in a school of public health accredited by the American Public Health Association leading to a degree in public health.
3. A minimum of three years of satisfactory and progressively responsible full-time experience as a public health physician, of which at least one year must have been in the administration of a generalized public health service, and one year must have been in the public health aspects of the specialty to which an appointment is to be made. A course in the clinical aspects of the specialty of not less than 6 months in a teaching hospital may be substituted for the latter, or a course in an accredited school of public health designed to meet the needs of such specialized service.

Most accredited schools of public health are now offering courses specially arranged to meet the individual needs of physicians interested in and preparing to direct the specialized services with which this report is concerned. It is customary for all such students to devote the first semester to certain basic courses essential to all graduate students in public health, such as public health organization and administration, principles of epidemiology, vital statistics, and environmental sanitation. During the second semester specializing students are diverted to courses in line with their special interests. For example, epidemiologists will have further training in differential diagnosis, statistics, sanitation; maternal and child health directors in pediatrics and obstetrics; cancer control officers in tumor clinics and pathology; mental hygiene directors in psychiatry and child guidance, etc. The school also arranges the required field training in line with the specialty.

It is fully recognized that occasionally physicians who have taken postgraduate academic courses in public health subsequent to their having qualified as specialists, or have taken none at all have demonstrated administrative ability of a high order. It is also true that a public health course does not insure a good administrator. It does, however, provide the best basis upon which to develop administrative talent in public health work and offers greater assurance of satisfactory performance as the head of a service than clinical proficiency in the specialty of medicine to be promoted.

It is further recognized that the administrator of these specialized services in the smaller health department will be expected to do more clinical and less administrative work. Even here, however, it is believed that most schools of public health will arrange to meet his needs through their coöperative relationship with their medical school, and that even in the smaller health department the administrator must rely largely on the part-time services of the best qualified clinicians available.

In addition to the academic education and field training recommended above, the administrator of a specialized service should possess such qualities as leadership, ability to establish and maintain favorable relations with the public, the medical profession, and his own personnel, adaptability, creative ability, common sense, judgment, and pleasing personal appearance.

EDWARD S. GODFREY, JR., M.D.,
Referee

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POINT FOUR

IT is a curious circumstance that a program which — to many of us — seems to be the most vital of all factors in world peace and in the salvage of civilization should have no name. It is described officially as "Technical Assistance to Underdeveloped Areas"; but "TAUA" would carry the practice of alphabetism to unwarranted lengths.

This program is generally called Point IV because President Truman in his inaugural address, after reviewing three basic and well understood elements in our international policies, added as a fourth point that "we must embark on a bold new program for making the benefits of our scientific advances and industrial progress available for the improvement and growth of underdeveloped areas . . . we should make available to peace-loving peoples the benefits of our store of technical knowledge in order to help them realize their aspirations for a better life. And, in coöperation with other nations, we should foster capital investment in areas needing development. Our aim should be to help the free peoples of the world, through their own efforts, to produce more food, more clothing, more materials for housing, and more mechanical power to lighten their burdens."

A reasonable degree of safety and satisfaction for all peoples is the essential basis of any possible stable world order. It was once said that the United States could not survive "half slave and half-free." One World cannot survive half-rich and half-poor, in the extreme degree which now prevails. Anarchy and totalitarianism are the offsprings of human suffering and despair. Democracy and freedom can survive only where there is at least some degree of hope. That is why these few sentences in the President's address have fired the imagination of thoughtful leaders in every quarter of the globe. A serious program of reconstruction for undeveloped areas can perhaps do more than international conferences, or diplomatic maneuvering or "cold wars" or "hot wars" to save civilization in the coming years.

What is the problem? The figures below make clear its magnitude and its urgency. The State Department has given us the following comparisons of three types of areas; developed (the United States, Canada, Western Europe, Australia

and New Zealand); intermediate; and underdeveloped (most of South America, nearly all of Africa and all of Southern Asia).

	Developed Areas Less than One-fifth	*Intermediate Areas Less than One-sixth*	*Underdeveloped Areas Two-thirds*
Proportion of Total World Population			
Per Capita Annual Income, Dollars	461	154	41
Food supply, calories per day	3,040	2,760	2,150
Literacy, per cent	95	80	22
Physicians per 100,000 population	106	78	17
Life Expectancy at birth, years	63	52	30

To raise the living standards of the underdeveloped "two-thirds of a world," the President suggests no grandiose program of financial aid but merely two practical steps, the making "available to peace-loving peoples of our store of technical knowledge" and, the fostering of "capital investment in areas needing development."

The first of these objectives was expressed by Senator Austin as follows: "Our twentieth-century know-how must be spread to every corner of the earth through the development of show-how"; and the primary fields of technical service must be in the areas of food and of health. Take one concrete example in which these two fields overlap. The World Health Organization sent a team of six malaria experts into a sample area of Greece. In one year these men, with a very small outlay for DDT and spraying equipment, increased farm production between 20 and 30 per cent; and trained their Greek colleagues so effectively that the program is now rapidly extending into adjacent areas. At New Delhi in India, there were recently gathered together at the regional offices of the WHO, delegations from Afghanistan, Burma, Ceylon, India, Thailand, and French and Portuguese India. At this conference it was reported that 60 per cent of all deaths in Thailand were caused by malaria and that production of rice for export to other countries could be vastly increased by control of malaria. It was noted that when an Indian official inquired why agricultural production was so low in the Simla Hill States, he was told that the tremendous incidence of venereal disease was the chief limiting factor. In Thailand and India, as well as in other neighboring countries, WHO is doing yeoman work in counselling and demonstrating and training personnel for defense against malaria and syphilis. It is doubtful if any other conceivable measures can accomplish so much for the cause of peace in the crucial area of South-eastern Asia.

The sort of service contemplated is, of course, not a novelty. The Rockefeller Foundation has been providing similar leadership in the health field for many decades. The Institute of Inter-American Affairs and the Interdepartmental Committee on Scientific and Cultural Coöperation have provided invaluable assistance, particularly in Latin America. The United Nations itself and its specialized agencies have begun the provision of technical assistance to underdeveloped areas (as in Haiti for example). What is new is the crystallization, at a critical juncture of history of a constructive and universal policy of mutual aid and reconstruction.

The concepts of Point IV have been hailed with acclamation throughout the world. President Truman's proposal has been cleared through the Social and Economic Council and approved unanimously by the Assembly of the United

Nations. The UN has now requests for aid from Afghanistan, Bolivia, Mexico, Pakistan, the Philippines, and half a dozen other countries. A tentative two year budget has been approved for $86,000,000, of which the largest single items are for Agriculture and Forestry and Health (twenty millions). President Truman has asked the Congress for an authorization of $45,000,000 as our share in initiating this program, of which $10,000,000 is already available. The funds contributed by the United States for this general purpose may be contributed either directly by bilateral agreement with individual underdeveloped nations or through the United Nations.

It seems of vital importance that the program should be carried out to the greatest possible extent through the medium of the UN and its affiliated agencies. Direct grants from the United States to particular nations could not fail to arouse suspicion of our motives in countries where there is a strong tide of nationalistic patriotism, and a not unnatural suspicion of possible imperialistic and selfish motives on our part. On the other hand, such bilateral contracts would be likely, in the end, to arouse in this country resentment against our "holding the bag" alone. It would, in general be far better for us to function as a coöperating member (though on a major scale) of an international team of 59 nations, with only the common interest of all in view. The UN policy, in this regard, contemplates specific requests for aid from governments concerned, with the countries desiring aid themselves participating in the cost to the fullest possible extent.

The program for Technical Aid to underdeveloped areas is not primarily a part of the "cold war," although it may contribute materially to the winning of that war (particularly in South-eastern Asia). It looks far beyond the present crisis envisaged by the Marshall Plan toward a world of the future.

It is not a relief program for feeding starving millions; or a vision of a world T.V.A. which would reorganize national economy overnight and impose upon primitive peoples the "American way of life." In its first stages, it is a direct, simple, practical procedure for providing — in coöperation with other highly developed nations — the leadership of trained technical personnel to assist underprivileged peoples in improving their standard of living, a program of pump-priming, of helping such people to help themselves, with major possibilities of improvement in total world economy as a possible result. President Truman has estimated that a 2 per cent increase in the purchasing power of the underdeveloped areas would keep American factories working at full speed to satisfy the increased demand.

Finally, the cost of the proposed program is an almost insignificant one, by comparison with our other international commitments. The total sum to be made up by all the nations of the world is less than $100,000,000, as compared with the billions involved in the Marshall Plan.

The readers of this *Journal* should be interested in this program as American citizens and as citizens of the world. They should be even more alive to its possibilities than others because public health in its broad sense (including nutrition and disease control) is the central objective involved.

We urge all members of this Association to write to the State Department at Washington for its admirable public documents dealing with Point IV; and to see to it that their representatives and senators at Washington realize that this program must not fail. At present, the requested sum of $45,000,000 (including $10,000,000 already available) has been reduced by the House of Representatives to $25,000,000

(meaning only $15,000,000 of new money instead of $35,000,000). It is to be hoped that the Senate will insist on a more constructive procedure.[1]

1. Those interested in this subject may obtain pertinent material from the State Department. Two other valuable reports are
Point 4 and the World Economy, J. B. Condliffe. Foreign Policy Association, 22 E. 38th Street, New York 16; and
Technical Assistance for Economic Development. Carnegie Endowment for International Peace, 405 W. 117th Street, New York 27.

THE SOCIAL WORKER IN TUBERCULOSIS CONTROL

SOCIAL and economic factors are of major significance in most aspects of the modern public health campaign. That is why the Harvard School of Public Health begins its training of all public health workers with a basic required course on human ecology; and why the new school being organized at the University of Pittsburgh plans to employ the same approach. In the case of tuberculosis, social and economic and emotional factors are of particularly grave importance, on account of the maximum age incidence of this disease in the wage-earning period and the long period of disability which is involved. We have recognized this fact, in such states as New York, by freeing sanatorium treatment from all limitations of a means test; and this represents a vital forward step. The support of the family during the treatment period and the subsequent problems of rehabilitation still present a major challenge to the social worker.

Two recent contributions to our understanding in this field should receive the serious attention of the health administrator. The first of these dealt with the problem in San Antonio, Tex.[1] Here we have an "Anglo-American" group with an annual income of $256 per person and a tuberculosis death rate of 46 per 100,000; contrasted with a "Latin-American" group having a comparable income of $141 per person and a tuberculosis death rate of 143 per 100,000. These marked discrepancies led to the creation of a County Tuberculosis Control Board with power to provide financial aid to persons suffering from tuberculosis and to dependent members of their immediate families. In its first year of operation (1948) this Board dealt with 726 families, of whom 133 were rejected as ineligible, 178 had their problems adjusted by case work only and 415 received in addition some financial aid. This is an interesting experiment and the technique might well be considered in comparable areas.

The second study[2] was made under widely different — and, in general — more representative conditions. This was in the City of Philadelphia, where the tuberculosis rate is only moderately excessive (48 per 100,000 in 1948); and where there is an active Division of Tuberculosis in the Health Department, the oldest voluntary tuberculosis association in the country (dating back to 1892), and the admirable background of the Henry Phipps Institute. Yet more than a third of the citizens of Philadelphia who died locally had not been reported as living cases; and the shortage of hospital and sanatorium beds is so great as to limit seriously the success of the program.

As a part of a comprehensive analysis of the total Philadelphia situation, Ruth B. Taylor[3] has conducted an intensive study of social services provided for the tuberculous and their families. Forty-three different agencies were covered in the survey, with commendable thoroughness. The principal findings were that there are no social workers employed by the Health Department; that medical-social service in tuberculosis hospitals is inadequate; that persons classified as "social workers" are,

in many cases, not of professional caliber; that very few tuberculous families actually receive service from community social agencies; that no adequate use of social service experts is made in overcoming resistance of patients to institutional treatment; and that psychiatric counselling is sought only rarely by the patients themselves and even more rarely by the doctors, nurses, or social workers caring for such patients. The major recommendation for the future is that "medical-social workers should be provided in the local health department to give case work services to tuberculosis patients, to provide consultation to other professional persons working with the tuberculous, to develop closer working relationships with other community social agencies, and to furnish data on the unknown social needs among the tuberculous so that additional social facilities may be developed.

"A medical-social consultant should be added to the staff of the Health and Welfare Council. She should assume some responsibility for improving the standards for social service in the settings where social workers are already employed and stimulate their employment in other places where they are needed.

"The number of trained medical-social workers in the hospitals should be increased to provide more adequate service to the patients, and the inappropriate jobs being handled by many medical-social workers should be assigned to the proper persons."

Better coördination of medical, social and rehabilitation facilities,[4] review of administrative procedures, more use of psychiatric service and research are among the other needs stressed.

It would seem that the health officers of states and of large cities (who have not already done so) might well give serious consideration to the importance of adding medical-social workers to their own staffs; or as an alternative, providing for the fullest use of other community agencies in providing the social service which is so important a factor in the control of tuberculosis.

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1. Zeck, J. *Pub. Health Rep.*, 64:1541 (Dec. 2), 1949.
2. Teague, R. E. *Pub. Health Rep.* 65:269 (March 3), 1950.
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4. The Federal Security Agency has recently issued a useful pamphlet on Opportunities for the Tuberculous through Vocational Rehabilitation.

PROGRESS IN THE TREATMENT OF SEWAGE AND INDUSTRIAL WASTES

THE issue of *Sewage and Industrial Wastes Engineering* for March will have been studied by the members of our Engineering Section with keen interest. Its major findings are of significance for the health officer and for all who are interested in the general cause of public health.

A National Census of new construction, taken for the first time since 1942, shows that progress in this field has really struck its stride for the first time since the war. During the year 1949, construction was begun on nearly 1,000 plants for the treatment of sewage and industrial wastes. M. M. Cohn, who summarizes the results, estimates that the total cost of these undertakings will amount to some 200 million dollars. It is encouraging to note that more than half of the 665 projected sewage treatment plants are in communities of less than 5,000 population. The new plants for treatment of industrial wastes are 284 in number, showing the readiness of industry to coöperate in the control of stream pollution. In many localities it is

necessary to construct special industrial treatment plants of this type; but Mr. Cohn points out a definite trend toward the planning of plants designed to handle both domestic sewage and industrial wastes, where this is feasible. Municipalities and their industries are joining together to coöperate in programs for joint treatment (with payment of service fees by the industries concerned).

The standard methods of treating sewage are proving capable of dealing with the problems of today, with increasing emphasis on mechanization in the handling of screenings, grit, sewage solids, sludge, grease, and chemicals. There is an encouraging tendency toward complete treatment — rather than primary treatment alone; and toward the use of chlorination.

Finally, it is noted that "the year pointed up the desirable trend toward the use of kitchen waste shredders and the decision of designers and state and local authorities to stop fighting the inevitable and start providing for them."

THE 1950 YEAR BOOK

THE American Public Health Association *Year Book* for 1950 is now in the hands of our readers. It contains, as usual, the vitally essential lists of officers and committee members and the reports of governing boards and standing committees and coördinating committees (whose work is the life-blood of the Association). The volume for this year also includes an unusually large proportion of reports of committees on various specialized problems — many of which might almost as well have been published in these columns and should be considered as a special supplement of the *Journal*. We call attention in particular to reports on Progress in the Control of Air-borne Infections, on The Engineering Section Project, on The Expanding Scope of Municipal Public Health Engineering, on Water Supply, on Chemicals Introduced in the Production of Foods, on Administrative Practices in Industrial Hygiene, on Thermal Standards in Industry for Atmospheric Comfort, on Pneumoconiosis, on Wyatt Galt Johnston and the Founding of the Laboratory Section, and on How To Judge the Effectiveness of a School Health Program. These are all documents of wide and fundamental interest.

Clearing House on Public Health Salary Information and Personnel Needs

PUBLIC HEALTH STATISTICS—A CAREER WITH A FUTURE

The vocational series *Careers with a Future,* published by the American Public Health Association, welcomes another addition to its family of three. *The Public Health Statistician,* a 7 page booklet is just off the press and ready for distribution. It was prepared by the Committee on Opportunities and Functions of Statisticians of the American Public Health Association Statistics Section. The booklet in clear and simple language gives an up-to-date picture of the activities of public health statisticians, describes the recommended preparation, the employment and economic outlook, and lists sources of information and institutions for training. (1–5 copies are available for vocational purposes free of charge; quantities of 6–99 copies sell for 10¢ each.)

FOLLOWING THE LEAD OF BUSINESS

"Each summer as a new batch of young scientists has graduated from college, government scientific agencies have watched helplessly while industry signed them up." With these words *News Week,* December 19, 1949, begins a story of how the U. S. Bureau of Standards and the U. S. Navy joined up to lure some of the bright young men into their folds.

The brain child was that of the Bureau of Standards' personnel officer, Ray Randall. Without waiting for them to be graduated he decided they might as well do some scientific interning, as it were, during summer vacations instead of washing cars or slinging sodas.

Hence, in 1948, tests were offered for various scientific jobs in the Bureau as well as in the Navy. Those making a grade of 90 or better were invited to work at a total of $600 or $700 for the summer.

In 1948, 2,000 persons applied and in 1949 5,000. From the two years' crop the Bureau has 39 persons now working for it and 79 still on leave to complete work for a bachelor's or a graduate degree. Navy results have not been reported. Could this technique be applied for the recruitment of public health personnel?

A RECRUITMENT TECHNIQUE

Hospitals, the Journal of the American Hospital Association, reports an interesting recruitment technique tried by the Pennsylvania Hospital in Philadelphia. This hospital held a one day workshop on hospital careers to which high school guidance counselors were invited, with the purpose of giving them more than a passing knowledge of hospital function and the specialized personnel required to operate it. The morning session was devoted to a symposium presentation by representatives of the various specialty departments of the hospital. These presented the latest information about career opportunities in medicine, nursing, laboratory, and X-ray technology, personnel relations, social service, physical therapy, dietetics, accounting, purchasing, secretarial, medical records, and administrative positions to say nothing of service positions. Rotating workshop conferences for discussion and questions with those who presented the subjects at the morning session were held in the afternoon. The story is briefly reported in *Hospitals* for April, 1950, Vol. 24, No. 4.

It is doubtful whether the hospital superintendent would welcome a flood of letters asking for further details.

NORTH CAROLINA STUDIES SALARIES

As of January 1, 1950, the Merit System Council of North Carolina made two salary studies. One was a study of salaries paid to clerical workers in private and governmental employment in the state. The office managers of 32 employment service offices in the state secured information from at least ten each of private and governmental agencies in their areas, on the prevailing entrance salaries on January 1, 1949, and 1950, for five grades of clerical positions comparable to merit system classifications. Neither the minimum entrance salaries nor the percentage increases in minimum salaries between 1949 and 1950 of government employment could be compared unfavorably to the same salaries in private employment.

The other study was a "Wage Survey Report, 27 Classes of Positions Common to Local Health Units, January 1, 1950." It was based on a mail inquiry answered by the Merit System supervisors of 39 of the 48 states. The tables show minimum and maximum monthly salaries for the 27 positions, each of which is defined as to duties and qualifications. The only interpretive summary included is "A study of the data received reveals wide variations in salaries paid for comparable classes of positions."

In the past several months, the Clearing House has reported a number of similar studies by various states. Perhaps the time has come to consider the substantial burden such queries must place upon the Merit System or personnel supervisor of a state or a state health department. Does a salary survey by an individual state produce substantially different or more complete data than the periodic surveys both of state and local health departments' salaries that have been made by the Public Health Service for the Association of State and Territorial Health Officers and A.P.H.A.? Would anything be gained by concentrating effort on these studies rather than scattering fire in several directions? If these periodic studies of public health workers' salaries by the Public Health Service do not meet the needs of various states, might it be good practice to suggest unfilled needs with a view to cutting down the number of questionnaires required of state officials?

WHAT DO DOCTORS EARN?

The American Medical Association and the U. S. Department of Commerce are conducting what they hope will be "the most complete and authentic survey of physicians' incomes in history." Nearly two-thirds of the 200,000 physicians in the country will be included, most of them without any identifying information whatever, but a control group of 10,000 is being given a code number for follow-up purposes. This code number, however, will not be passed on to the Department of Commerce. Also, a group of 15,000 are being asked to fill out a more detailed form covering income for the 5 years, 1945–1949.

The American Medical Association points out that the Survey will be only as good as the coöperation of physicians make it, while the Commerce Department reminds everyone that returns will be dealt with statistically only and will not be available to the Internal Revenue Bureau. The analysis of the Survey will appear both in the *Journal of the American Medical Association* and in the *Survey of Current Business* of the Commerce Department.

Credit Lines

HOW ACCIDENTS HAPPEN ISN'T FUNNY

The Annual *Book of Street and Highway Accident Data of The Travelers Insurance Companies* is out. This year it is called "Maim Street." Each two page spread is made up of accident figures and then interpretation on one side and a cartoon illustrating some accident producing human frailty on the other.

"Speed was a greater factor in traffic casualties last year than any time in history." "Youthful drivers (in spite of the first downward turn in their accident rate) are still the cause of thousands more deaths and injuries than their numbers warrant." There were fewer deaths but more accidents in 1949 than in 1948. These are some of the findings reported.

"Nothing in the booklet is copyrighted and permission to reprint any of the facts, figures or illustrations is freely given" says the flyleaf. It should have wide usefulness. Available from Harry Barsantee, Supervisor, Traveler News Bureau, Hartford, Conn.

CONVINCING COUNTY SUPERVISORS

With the passage of the state aid to county health departments' law in New York in 1946, the State Health Department began an accelerated program of developing local health services. This has already resulted in the establishment of seven new county departments, some of them in urban counties with previously existing city health departments. Among the techniques used by the State Health Department are county surveys, with recommendations, made at the request of the county supervisors. Two of these surveys have been made in recent months, one in Onondaga County in which the chief city of some 250,000 population already has a full-time health department and one in rural Sullivan County. The attractive reports of these surveys might well serve as models both in idea and execution to other state health departments with a need to convince county supervisors of the need for overall county health departments. New York State Department of Health, Albany, N. Y.

ST. LOUIS LABOR HEALTH INSTITUTE

The Labor Health Institute of St. Louis is one of the pioneer non-profit prepayment medical care plans organized on the basis of group practice by labor. In the absence of standards promulgated by any national agency, the Institute on the joint request of the St. Louis Planning Council asked two medical and hospital consultants to survey and evaluate the quality of service given. The authors of the survey, Henry G. Farish, M.D., and Franz Goldman, M.D., developed a set of criteria based largely on Minimum Standards for Medical Service in Industry and Minimum Standards for Hospitals of the American College of Surgeons. Their report, *Labor Health Institute: Quality of Service* is presumably available from the Labor Health Institute, St. Louis, Mo.

VENEREAL DISEASES IN PLAIN TALK

The Baltimore City Health Department has recently issued seven 4 page leaflets on syphilis and gonorrhea for general distribution. Their outstanding characteristic is that they are in plain and simple language that is neither prurient nor prudish. The sentences are short; they deal with actual situations and lay the ghosts of much misinformation that is still current. The author is

Nels Nelson, M.D., director of the Bureau of Venereal Diseases. They are reproduced in the Feb.–Mar., 1950, *Baltimore Health News* (27:2, 3) which announces that the leaflets are available in quantity from the Bureau of Venereal Diseases, 202 Guilford Ave., Baltimore. We warn you this may not apply outside Baltimore.

EXPLORING OCCUPATIONAL CANCER

Occupational Cancer: A Challenge to the Physician has been published by the New York State Department of Health for the State Occupational Cancer Committee with the joint sponsorship of the State Medical Society and the State Department of Labor.

This little pamphlet is by way of stimulating practising physicians to be occupational-cancer-conscious, and making it easy for them to report all such cases to the State Department of Health. The pamphlet includes a suggested report form as well as an occupational history form. Address requests to Dr. Leonard Greeenburg, Division of Industrial Hygiene and Safety Standards, New York State Department of Labor, 80 Centre St., New York 13.

MULTIPHASIC SCREENING SAID SIMPLY

Orchids to *Public Health News* of the New Jersey Department of Health (31: 3 (Mar.), 1950). It has an article, "Single-package Health Exams May Be Next Development." Whether or not original with the editor, Ralph T. Fisher, it represents a long step toward letting citizen Joe know that "Multiphasic Screening" is not a mysterious, newfangled disease.

CANCER DETECTION

Cancer News for February, 1950, contains a valuable survey of the "Cancer Detection Problem." It reports the outstanding results of a conference called by the American Cancer Society last fall, at which various panels of experts discussed the techniques involved in diagnosis of pelvic cancer, of lung cancer, of gastrointestinal cancer, and the laboratory and statistical procedures involved in the detection technique. This review should be of interest to health administrators, as well as to the staffs of the 251 cancer detection centers now operating in the United States and examining some 3,000 persons each week. *Cancer News* is published by the American Cancer Society, 47 Beaver St., New York City.

"COMICS" AND PUBLIC HEALTH

Comic readership is strictly a 20th century phenomenon and "comic" magazines are less than 20 years of age. This medium, however, in marketing both products and ideas, has found a niche among the many media of communication.

The main theme of *Lucky Fights It Through,* as developed by Educational Comics, Inc., and printed in 1949 by the Columbia University Press (2960 Broadway, New York), is that of venereal disease control. Although it is a "comic" magazine without humor, it has plenty of action and a wholesome ending, including a romance. This 16 page publication undoubtedly has an appeal for that segment of the young adult population which is apt to read this type of communication and, incidentally, also may have venereal disease. As such, there seems to be no good reason why it should not be used. It is a vast improvement over the usual horror stories that now clutter the bookstands. Furthermore, many industries have found it effective and are using this type of communication medium.

KANSAS GETS ON WITH THE JOB

Kansas was one of the 5 states that took part in a Kansas City Regional Conference on Local Health Units under the auspices of the National Health Council in April, 1949. It called a

similar state-wide conference in November of that year. Proceedings have now been published and they constitute a laboratory document on the process of organizing a citizens' council to be the spearhead of a state-wide grass roots movement to get adequate health protective services for every person. You should further know that the first meeting of the resulting State Health Council was held in May, 1950.

A similar conference and similar proceedings have come out of Oklahoma. These two reports are available respectively from the Kansas State Health Department, Topeka, and the Oklahoma State Health Department, Oklahoma City.

A PLEA FOR TUBERCULOSIS BEDS

"Address Unknown" is the title of a plea for more hospital beds for Texas. The address unknown is that of a hospital for the person, particularly a child with active TB. It concentrates chiefly on the pocketbook and state pride nerves by showing how much more costly is the social and economic cost of as many as 10 persons infected from one active case than is hospitalization of the active case. And it further knows that Texans will not want to allow 41 states to do better about a situation than Texas. The pamphlet is an excellent production job in red, white, and black. The illustrations are effective. Written by Dorothy and Terrell Blodgett, financed by the H. E. Butt Foundation, and published by the Institute of Public Affairs, the University of Texas, Austin, from which it is presumably available.

WHAT PUBLIC HEALTH COSTS BY TOWNS

Connecticut has 169 towns and cities. All but 6 have populations of less than 50,000; all but 13 of less than 20,000. In the March, 1950, *Connecticut Health Bulletin* local expenditures for health by towns are analyzed for 1948. The range was from no expenditures in two towns of less than 2,500 to $2.23 per capita in a city of 37,000. The figures indicate that the smaller towns on the average bear a higher per capita burden. The remedy suggested by the author is the formation of district health departments by several towns thus becoming eligible for state aid. It might also be added that four horses may easily pull a load that one would find wholly impossible.

IT WON'T HURT TO SAY IT AGAIN

Lily Tulip Cup Corporation is distributing a playing card size calendar with these simple rules for improving public relations:

1. Sell Yourself First — Smile — be friendly — find something to compliment.
2. Emphasize Advantages — Show specifically what will be gained from your recommendations.
3. Illustrate — Tell of others who followed your recommendations and gained.
4. Use Easily Understood Terms — A man can't do what he doesn't understand.
5. Suggest — Don't Command — You catch more flies with honey. . .

Public Health is Purchasable — Consequently Salable.

ANNUAL REPORTS

Annual Report, 1948, Department of Health and Public Welfare, Province of Manitoba is worth some examination. Of particular interest are the chapters on Extension of Health Services and Local Health Services. Here one finds that of about half a million population of the province outside Winnipeg, 50 per cent now have the services of 13 full-time local health departments covering 66 municipalities, or an average of 5 per unit. Apparently there is no insuperable difficulty about intermunicipal coöperation in the health field.

The spirit of sober, factual reporting, without fanfare or exaggerated claims of achievement are a pleasure to read. And the tables of the hogs and Holsteins, oats, and cream, and cabbage, raised, used, and sold are fascinating. Under-

sized cabbages, turnips, etc., are fed to livestock—you might like to know.

Annual Report for the Year 1949, National Health Council was distributed at the Council's annual meeting on March 24. As has come to be expected, it is a good looking and dignified production, bearing the Council's trade mark of the well rounded community.

The Council's vitality is symbolized by the fact that six national agencies joined its fellowship during the year. Another testament to its expanding interests and service is the broadening of its membership provisions to include as associate members national organizations with broad civic interest, as well as those directly concerned with health.

The report is well worth study as a record of democratic coöperation by a varied group of agencies with a common goal "the promotion of health throughout the nation."

Eyes to the Future is the 1949 annual report of the National Society for the Prevention of Blindness which gives some outline of the plans for saving from blindness at least half of the 220,000 Americans who may be expected to lose their sight in the next decade unless something is done about it. Its title page also emphasizes the pioneering of the agency in listing various of the "firsts" in the society's 41 year history from the first campaign in 1908 to eradicate "babies' sore eyes," to the first complete text on dangers to vision in the growing chemical industry, "Toxic Eye Hazards," published in 1949.

In accord with what seems to be a welcome 1950 fashion, the report is restrained, well printed in subdued colors and print. National Society for the Prevention of Blindness, 1790 Broadway, New York 19.

1948 Guide Post to Health is the annual report of the San Jose (Calif.) Department of Health. Its unique feature is that it is a filled-in copy of the A.P.H.A. *Evaluation Schedule* (dressed up with illustrations to be less formidable looking). On alternate pages is a running commentary on the data reported in the schedule. This technique, particularly the popular adaptation of the *Schedule*, might well be followed elsewhere.

WORTH ACQUIRING

Guest-Chamber for the Soul; Public Health in the Netherlands is prepared by the Netherlands Information Bureau with the "aim of furthering friendship and understanding between the American people and the Dutch." The present public health situation is described in the historical background of medicine and illustrated both with modern and ancient photographs and a Rembrandt painting. The quality of technical production is unusually high. The Netherlands Information Bureau, 10 Rockefeller Plaza, New York 20.

Columbia University Educational Films is a pamphlet listing and describing briefly films on emotional health, child development, education, and health. The conditions under which the films may be secured are also given. Columbia University Educational Films, 413 West 117 St., New York 27.

BOOKS AND REPORTS

All reviews are prepared on invitation. Unsolicited reviews cannot be accepted.

The American Family—A Factual Background—*Report of the Inter-Agency Committee on Background Materials, National Conference on Family Life, May, 1948, Washington: U. S. Gov. Ptg. Office,* 1949. 457 pp. Price, $1.25.

This volume was prepared by an interdepartmental committee of Government agencies to provide background material for the National Conference on Family Life, held in Washington May 5–8, 1948. The overall objective of the conference was "to discover specific means by which the American family may be strengthened for the benefit of its individual members and society." Seven sections devoted to one aspect of family life are collected in this volume. These deal with basic family and population statistics, the family in our economy, education and the family, family health, housing, the legal status of the family, and income maintenance and social services. The text is supplemented by numerous tables and references to other sources.

It is a truism to say that the family is a basic social unit of health and disease. What this means is clearly evident to public health workers as they go about their daily task. At the same time it is of importance to recognize that the family as a social entity has been changing its character, and that this change in turn has had and will continue to have an effect on public health.

While this volume was prepared specifically for the National Conference on Family Life, there is no doubt that it can serve a wider purpose and be of considerable value to all those concerned with the American family today, and this means, among others the public health worker. Close study of this volume will help one to understand what is happening to the family and how this may affect the public health program of tomorrow.

GEORGE ROSEN

Industrial Health Department Functions and Relationships — *By C. O. Sappington. Medical Series: Bulletin No. VIII. Pittsburgh: Industrial Hygiene Foundation,* 1948. 98 pp. Price, $2.00.

The data and comments presented in this bulletin are the result of a personal survey by the author, covering 278 industrial plants, employing over 1 million workers, located in 33 states, and represent a good cross-section of American industry. The plants ranged in size from those employing less than 500 to those employing over 10,000 workers. It is essentially an inventory of industrial health services, facilities, procedures, and policies. It furnishes considerable food for thought for industrial physicians and plant management, especially for those contemplating the introduction of a plant medical department. Of particular interest are suggestions for the improvement of medical services, a discussion of cost systems and methods for establishing, maintaining, and recording and computing the cost of health services in small plants. It provides excellent information for those persons active in the promotion of comprehensive health services for industrial workers.

ALBERT S. GRAY

Industrial Fluorosis—A Study of the Hazard to Man and Animals Near Fort William, Scotland—*By John N. Agate, G. H. Bell, G. F. Boddie, et al. Medical Research Council Memorandum No. 22 London: His Majesty's Stationery Office,* 1949. 131 pp. Price, 4s.

This is a report on an investigation of the effects of exposure to fluorine compounds released in the manufacture of aluminum at Fort Williams and Kinlochlevin in Scotland.

It represents a most interesting and complete investigation embracing the environmental features surrounding the plants; studies on the concentration of fluorine on water, soil, and atmosphere; the effects of fluorine compounds on animals and man; on the dentition of adults and school children and the physical properties of bone in cases of fluorosis. The report contains a valuable appendix on the toxicity of fluorine compounds and a description of analytical chemical methods for the determination of fluorine.

The positive findings among animals in the vicinity of the plants and among the workers in the plants make it clear that, in the present instance, the dissemination of fluorine in the plant atmosphere and in the surrounding geographical districts clearly points to a definite health hazard.

To those interested in today's problems of general atmospheric pollution, this pamphlet is of much importance, both from the point of view of the technique in the making of such studies and the presentation of results.

LEONARD GREENBURG

Alcohol and Social Responsibility —*By Raymond G. McCarthy and Edgar M. Douglass. New York: Crowell,* 1949. 304 pp. Price, $3.50.

Here is a book long overdue, a close approach to excellence, by two schoolmen, disciples of learning, yet pedagogues by profession. There is little if any vestige of bias, but throughout a rigorous acceptance of the coin of truth that has two sides.

The novelist, the dramatist, the physician, psychologist, jurist, evangelist, sectarian, publicist, advertiser, and cynic has each offered his story, his fraction of that complex truth that consists of man in his social setting, befuddled by his inheritance, traditions, social economic and emotional stresses and ambitions, successes and frustrations, and his liquor drinking.

It is the bearing of personal choice, habit, and ignorance upon family and fellows of both sexes and all ages and conditions that is here quite honestly exposed and much clarified for great usefulness of school teachers and, it is hoped, for the enlightenment of pupils and parents. The authors seek "to provide an adequate background of broad general knowledge and a realistic basis for the advocacy of constructive attitudes."

The reader will not be threatened, pushed about, or indoctrinated. The facts related are honest, of the best origins and to be trusted.

Part I of 8 chapters deals with facts of beverage alcohol customs rarely better presented for day by day application. Part II of 6 chapters makes use of these facts in an approach through education in choice of personal conduct.

Differences of opinion and emphasis in terms or definitions will develop in any thoughtful observer of alcohol use and abuse of our times, and yet these will not be of great moment. Too little regard seems to be given to the inferiorities of conduct and emotion which commonly follow, although often unnoticed, the social use of little drinks. Drinking before driving is less criticized than facts warrant. Acceptance of cocktail parties and the habit is perhaps too easy. There is little understanding of the functions of a public health department, or respect for the evidence of vital statistics. And yet the achievement in Parts I and II is notable. Too much cannot be said in favor of Chapters 9 to 13 which deal with the job, methods, technics and results of school teaching.

The 3 Appendices, especially II on State Programs of Education, are good.

The bibliography, notes, and index are first class, and the text is remarkably free from errors.

This book, easily first in its class as to timeliness and importance, is to be unreservedly recommended. It is easily read and is packed with good sense.

HAVEN EMERSON

A Dynamic Approach to Illness: A Social Work Guide—*By Frances Upham. New York: Family Service Association of America,* 1949. 200 pp. Price, $3.00.

Although this book, as its subtitle indicates, is intended primarily for the guidance of social workers, it offers new insight and deepened understanding to all persons engaged in services to sick and disabled patients, or in the promotion of health. The extent to which the effective functioning of each member of the medical or health team is influenced by the interplay of social and psychological responses to illness and to medical care is clearly elucidated throughout the book and is especially well presented in Miss Upham's able analysis of the dynamics of inter-professional relationships. Physicians, nurses, and all auxiliary personnel, including the social worker, should find this analysis provocative of self-appraisal of one's approach to patients and of the factors in one's own personality and working relationships that may affect the efficacy of professional services.

For workers in the field of public health, the greatest value of this book probably will be found in the discussion of the meaning of illness, of professional team work, and of the case worker's rôle and services in Chapters II, III, and IV; and the specific applications of these fundamental principles in the chapters on tuberculosis, maternity and venereal disease. One would hope, however, that from such selective reading, the person interested chiefly in public health would be stimulated to read the whole of this short treatise for the clear, consistently sustained insight which it gives into the social and emotional responses of ill persons and of their families; for its sound attention to the responsibility of the community to maintain and extend adequate resources for care; and for its unusually rich, well integrated use of a wide range of medical, health, psychiatric, and case work literature.

DORA GOLDSTINE

Damage from Atomic Explosions and Design of Protective Structures—*Prepared for the National Security Resources Board,* 1950, Washington, D. C.

This report assesses in general terms certain effects of atomic weapons. The discussion is based on information gathered for a comprehensive report on the effects of atomic weapons and was prepared by the Department of Defense and the U. S. Atomic Energy Commission. Results of the bomb explosions at Nagasaki and Hiroshima furnish much of the information upon which recommendations are made.

All through the report, the assumption is that the effects of an atomic bomb equivalent to 20,000 tons of TNT are under consideration. Damage from such a bomb would result from mechanical blast effects and radiant energy such as heat, gamma rays, and nuclear particles. The first portion of the report deals with the extent of damage inflicted by the air blast from an explosion. The second part of the report deals with protective construction to guard against the effects of the air blast. Protection against radiant energy is not included.

The best type of construction has been found to be framed steel and reinforced concrete buildings. Commercial types of sheds with light frames and long spans of unsupported beams are the weakest. It is somewhat reassuring to read that well constructed frame residences show good resistance to blasts of ordinary

bombs and so it is assumed they would stand up fairly well under atomic bomb blast. (Of course, the effect of radiant energy is something quite different.)

FRANCIS B. ELDER

Community Health—*By Laurence B. Chenoweth, and Whitelaw Reid Morrison. (3rd ed.) New York: Appleton-Century-Crofts,* 1949. 314 pp. Price, $3.00.

This book, first appearing in 1934, has been thoroughly revised and brought up to date under the new title, *Community Health.* It is an elementary text which attempts to cover the broad and diverse fields of public health science in a small compass, and succeeds pretty well. There are omissions which it would seem desirable to have included, such as maternal, infant and child health, and some reference to mental health. In the chapter on Diseases Transmitted by Food, no mention is made of Salmonella infection. On the other hand, the inclusion of a discussion of accidents, and of certain chronic diseases as community health problems points up the recent trends in public health work.

There are some inaccurate statements, as for example that typhoid vaccine "is in general use," and that dried yellow fever virus is diluted with "human immune blood serum" before inoculation. The decline in scarlet fever in Cincinnati from 1870 to date, shown in a chart, is described as showing the value of isolation and quarantine!

The text is abundantly illustrated (111 figures) and there are eleven tables, some being more detailed than necessary in an elementary text. Good references for collateral reading are given after each chapter and there is a valuable glossary at the end of the book.

CURTIS M. HILLIARD

Malariology — A Comprehensive Survey of All Aspects of This Group of Diseases from a Global Standpoint—*By sixty-five contributors. Edited by Mark F. Boyd. Philadelphia: Saunders,* 1949. Volumes I and II. 1643 pp. Price, $35.00 per set.

Here is an authoritative reference work on malariology written by numerous American and foreign contributors. All chapters are in English. The editor is an internationally known malariologist of 25 years' experience in the field, laboratory, and editorial chair, who, to a remarkable degree, has succeeded in enlisting the coöperation of well qualified authors. History, parasitology, entomology, epidemiology, pathology, clinical aspects, and methods of control are included, and there is a chapter on therapeutic malaria. Standard technics of staining, counting, and cultivating plasmodia, of collecting, trapping, dissecting, and handling mosquitoes, and of conducting malaria surveys are given, with numerous charts and diagrams. Equipment and methods for using insecticides and for various types of anti-mosquito work are described. A notable feature is the world-wide scope of subject matter, which even includes material on malaria in the U.S.S.R. prepared by Russian authorities.

One expects the quality of such a joint effort to be uneven, and in this case the inadequacy of the chapters relating to therapy and suppressive treatment presents a contrast to the excellence of those dealing with clinical signs and symptoms. Format and type are good, as are many of the illustrations. But there are no colored plates of the plasmodia, a surprising omission from such a complete effort. The black and white microphotographs of parasites are poorly reproduced and are not satisfactory substitutes.

The monumental task of editing such an international effort has been well carried out by Dr. Boyd. Inaccuracies and contradictory statements have been kept to an average minimum, and the editor has been skillful in maintaining

a lucid style. References are reasonably adequate up to and including the year 1946. Indexing has been well done.

There is no other reference work on the subject of malariology in any language to equal the one under review. It will remain a standard for many years and no medical library of any importance should be without it.

PAUL F. RUSSELL

The Education and Work Experience of Community Organization Practitioners — *By Robert Irving Hiller. New York: Association for the Study of Community Organization, and Community Chests and Councils of America, Inc.*, 1949. 61 pp. Price, $1.25.

For the graduate student hoping ultimately to be employed in a council of social agencies, community chest, or other community organization, this review of the education, training, and opinions of a group of community organization practitioners has particular value. What is their educational and experience background and what do they wish they had done differently in preparing for their life work? is presented by the author.

The data were gathered from 266 of the 442 members of the Association for the Study of Community Organization classified on its membership list as engaged primarily in the practice of community organization in the United States. Doubtless many competent community organization practitioners do not belong to the Association for the Study of Community Organization. One wonders how their educational and experience backgrounds differ from those of the group studied.

Two out of three of these community organization practitioners entered social work practice in either the case work or group work fields, with community organization a later step. For the new worker, a master's degree in social work appeared to be desirable. The community organization field includes health as well as welfare, but health interest and experience are very seldom mentioned in the study.

The 15 tables and one chart are of real assistance in presenting the intricate picture of the age, sex, and general background of the group. For some reason the age groups ordinarily used by statisticians have not been used in the tables.

HOWARD W. GREEN

Nutrition and the Public Health: A Study Guide *(rev.)—By Adelia M. Beeuwkes and John J. Hanlon. Ann Arbor, Mich.: Overbeck*, 1949. 114 pp. Price, $2.75.

A useful course in nutrition for students of public health cannot be primarily a course in biochemistry, physiology, medicine, dietetics or home economics, but rather must be a blend of all these disciplines and others, presented in such a manner that the scientific knowledge available can be applied to practical problems in public health. There is great need for books which present nutrition from this point of view. This study guide is a constructive step in this direction.

Introductory chapters point out the relation of nutrition to public health, some of the benefits which can be expected from further application of present knowledge and some of the problems involved. These are followed by chapters which give in a concise form, and in nontechnical language, the scientific basis of the subject. Then follow chapters more pertinent to the application of the science such as: Food Fads and Fallacies, Nutrition in Maternal and Child Health, Nutrition in Geriatrics, Nutrition in Oral Health, etc. Attention is also given to the relation of a nutrition program to the departments and divisions of a state department of health and to classroom teaching and the school lunch program. In addition to references on specific subjects, a

list of general books and pamphlets, a list of books on food for elementary schools, a list of sources for supplementary material for nutrition education, and a classified list of films in nutrition are included.

The book, as the authors state in their foreword "... is meant to be used as a study guide—a guide that will be enlarged by the student through class work and through reading of current literature." The book will serve a useful purpose when used in this way. It will also be helpful to those who want to obtain a general, non-detailed knowledge of the relationship of nutrition to public health. OTTO A. BESSEY

Proceedings, Annual Meeting, Southern Branch, American Public Health Association, Dallas, Tex., 1949. 51 pp. Price, $.10 in stamps for mailing.

Here are the proceedings of the Southern Branch, A.P.H.A. in the Dallas meeting of 1949. The officers are to be congratulated on the quality of the program and the papers. They include a commendable emphasis on problems of particular interest in the southern states, they recognize promising contributions from the area of the Branch and they give the reader reason for knowing how dynamic this regional organization has become. Proceedings of nine sections are reported, together with the resolutions which recognize generous contributions of the David Graham Hall Foundation toward the printing of these proceedings.
REGINALD M. ATWATER

Physiology of Heat Regulation and the Science of Clothing—*Edited by L. H. Newburgh, M.D. Philadelphia: Saunders,* 1949. 457 pp. Price $7.50.

The Second World War—with operations extending from the upper atmosphere and the wastes of the Arctic to the Libyan Desert and the jungles of New Guinea—brought our Armed Forces face to face with problems of thermal adaptation of the gravest magnitude. To meet these problems, the Division of Medical Sciences of the National Research Council created a committee of civilians to conduct far-reaching studies on the physiological principles involved. A dozen governmental and private laboratories in the United States and Canada coöperated in an admirably planned and coördinated attack on the subject of man's relation to his climatic environment and, particularly, on clothing as an adaptive mechanism for both hot and cold surroundings. The present volume includes a series of nineteen essays by experts concerned in this study presenting the major problems involved. Students of this field owe a very real debt of gratitude to Dr. Newburgh for the enthusiasm and the persistence which made possible the preparation and publication of this invaluable work of reference.

It is, of course, impossible in this *Journal* to present a full review of an intensive technical treatise of this sort. F. R. Wulsin's anthropological survey of adaptations to climate among primitive peoples is fascinating reading, with its description of the highly successful heating and ventilation of the Eskimo domed snow house and of the astounding physiological adaptation to extreme cold of certain Australian naked aborigines. H. C. Bazett's chapter on the Regulation of Body Temperatures and Sid Robinson's chapter on Physiological Adjustments to Heat are model summaries of the fields concerned. The physical aspects of the human body's thermal adjustment are covered in detail by J. D. Hardy's chapter on Heat Transfer.

The last third of the book is devoted to the subject of clothing, which has become a major area of physiological research during the past decade. The application of principles developed in the laboratory to field problems is well

illustrated by H. S. Belding in a technical analysis of the problems presented by dry cold. W. H. Forbes in a review of recent work in this field summarizes more than 80 studies dealing with desert and tropical conditions and with protection against dry cold and wet cold. Paul A. Siple closes with a discussion of practical applications of the knowledge which has been acquired with regard to man's adaptation to seven major climatic zones, ranging from the humid tropical jungles to the arctic winter.

This is, of course, primarily a source book for the scientist. It will be a standard work of reference for the investigator in the field of thermal physiology. Among the readers of this *Journal* those concerned with the problems of industrial hygiene and of tropical hygiene or arctic hygiene will find it of vital significance. C.-E. A. WINSLOW

Texas Health Practice Indices, 1947–1948—*By Texas State Department of Health.* 137 pp.

The Texas State Department of Health is to be congratulated for its pioneering publication of *Health Practice Indices* on a state basis. The publication is a series of bar charts showing reported health practice in 41 health jurisdictions in Texas. Accompanying each chart are a few succinct and timely remarks of interpretation.

Texas Health Practice Indices will have many uses. It can be a realistic device for demonstrating health accomplishments and needs to appropriating bodies, to other influential citizens and to the public in general. It can be a ready source of reference and study for state health personnel in its advisory and consultative services to local health departments. These are only two of the most outstanding potential uses of the publication.

It is to be hoped that other states will follow Texas's leadership in the field of evaluation of local public health programs. ROBERT ROTHERMEL

BOOKS RECEIVED

Listing in this column acknowledges the receipt of books and our appreciation to the senders. Space and the interests of readers will permit review of some, but not all, of the books listed.

ALL THIS COULD HAPPEN ONLY TO AN ENGINEER. A. Cibulka. Highlands, Tex.: A. Cibulka, 1950. 237 pp. Price, $4.50.

AN APPRAISAL METHOD FOR MEASURING THE QUALITY OF HOUSING: A Yardstick for Health Officers, Housing Officials and Planners. Part III. Appraisal of Neighborhood Environment. New York: American Public Health Association, Committee on the Hygiene of Housing, 1950. 132 pp. Price, $3.00.

BACTERIAL INFECTION. WITH SPECIAL REFERENCE TO DENTAL PRACTICE (4th ed.) J. L. T. Appleton. Philadelphia: Lea & Febiger, 1950. 644 pp. 108 illus. Price, $10.00.

CANCER. A MANUAL FOR PRACTITIONERS (2nd ed.) Boston, Mass.: American Cancer Society (Massachusetts Division), 1950. 208 pp. Price, $2.00 or $1.50 for quantities of 100 or more.

CONFERENCE ON PROBLEMS OF AGING. Transactions of the Tenth and Eleventh Conferences, Feb. 9–10, 1948 and April 25–26, 1949, New York, N. Y. New York: Josiah Macy, Jr. Foundation, 1950. 258 pp. Price, $3.75.

COUNSELING THE HANDICAPPED IN THE REHABILITATION PROCESS. Kenneth W. Hamilton. New York: Ronald Press, 1950. 296 pp. Price, $3.50.

ENTOMA. A DIRECTORY OF INSECT AND PLANT PEST CONTROL 1949–1950 (8th ed.). Edited by G. S. Langford. College Park, Md. University of Maryland, 1950. 368 pp. Price, $1.50.

FACTORS REGULATING BLOOD PRESSURE. Transactions of the Third Conference May 5–6, 1949. New York: Josiah Macy, Jr. Foundation, 1950. 280 pp. Price, $2.55.

GUEST-CHAMBER FOR THE SOUL. Public Health in The Netherlands. D. H. Rodriques. New

York: Netherlands Information Bureau. 31 pp. Free.

GUIDE TO GENERAL MEDICAL PRACTICE. Martin G. Vorhaus. New York: Macmillan, 1950. 244 pp. Price, $3.50.

HANDBOOK OF BACTERIOLOGY (6th ed.) Joseph W. Bigger. Baltimore: Williams & Wilkins, 1950. 547 pp. Price, $4.50.

HARVEY CUSHING. SURGEON, AUTHOR, ARTIST. Elizabeth H. Thomson. New York: Henry Schuman, 1950. 347 pp. Price, $4.00.

HELP AT LAST FOR CEREBRAL PALSY. Eugene J. Taylor. New York: Public Affairs Committee, 1950. 30 pp. Price, $.20.

HUMAN FERTILITY AND PROBLEMS OF THE MALE. Edmond J. Farris. White Plains, N. Y.: The Author's Press, 1950. 211 pp. Price, $5.00.

IMPORTANCE OF THE HOSPITAL AS A TUBERCULOSIS CASE FINDING CENTER. New York: Hospital Council of Greater New York and The New York Tuberculosis and Health Association, 1950. 28 pp.

LAW OF MEDICINE, THE. Parnell and Justin Callahan. New York: Oceana Publications, 1950. 80 pp. Price, $1.00 paper bound, $2.00 cloth bound.

LIVER INJURY. Transactions of the Eighth Conference April 28–29, 1949. New York, N. Y.: Josiah Macy, Jr. Foundation, 1950. 164 pp. Price, $1.60.

MARKET-MILK INDUSTRY, THE. (2nd ed.) Chester L. Roadhouse and James L. Henderson. New York: McGraw-Hill, 1950. 716 pp. Price, $7.00.

MARRIAGE ANALYSIS. Harold T. Christensen. New York: Ronald Press, 1950. 510 pp. Price, $4.50.

NATURE OF NATURAL HISTORY, THE. Marston Bates. New York: Scribner's, 1950. 297 pp. Price, $3.50.

NUTRITION REVIEWS Vol. 7. Numbers 1–12. January–December 1949. New York: Nutrition Foundation. 393 pp. $3.00.

OPPORTUNITIES IN PHYSICAL EDUCATION. HEALTH AND RECREATION. Jay B. Nash. New York: Vocational Guidance Manuals, 1950. 80 pp. Price, $1.00.

PLACE OF STATISTICAL METHODS IN BIOLOGICAL AND CHEMICAL EXPERIMENTATION. Annals of the New York Academy of Sciences, Vol. 52, Art. 6, 789–942 pp. Edwin J. de Beer, et al. New York: N. Y. Academy of Sciences, 1950. Price, $2.25.

REPORT OF CONFERENCE ON MENTAL HYGIENE. Education for Public Health Nurses, November 14–18, 1949, New York, N. Y. New York: National Organization for Public Health Nursing, 1949. 19 pp.

SAW-GE-MAH (MEDICINE MAN) Louis J. Gariepy. St. Paul, Minn.: Northland Press, 1950. 326 pp. Price, $3.00.

STATE HEALTH OFFICERS COMMUNICABLE DISEASE CENTER CONFERENCE. Atlanta, Ga.: Communicable Disease Center, FSA-Public Health Service. 92 pp.

SURFACE-ACTIVE QUATERNARY AMMONIUM GERMICIDES. Carl A. Lawrence. New York: Academic Press, 1950. 245 pp. Price, $6.00.

TEXTBOOK OF BACTERIOLOGY (2nd ed.) Joseph M. Dougherty and Anthony J. Lamberti. St. Louis: Mosby, 1950. 491 pp. Price, $5.75.

UNDERSTANDING HEALTH. I. H. Goldberger and G. T. Hallock. Boston: Ginn and Co., 1950. 496 pp. Price, $3.28.

YOU AND YOUR HEART. H. M. Marvin, et al. New York: Random House, 1950. 306 pp. Price, $3.00.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

To Define the Health Problem —"Should we now abandon the infant mortality rate as an index and replace it by the stillbirth-neonatal rate, either by itself or in conjunction with the two separate components, a stillbirth rate and a neonatal rate?"

ANON. Infant Death and Stillbirths in Leading Nations. *J.A.M.A.* 142, 13:1014 (Apr. 1), 1950.

Answer to Reservationists — Chest surveys require more than equipment, technicians, and physician-readers, say these writers. A philosophy is called for. Also, they are merely a gesture if there is no adequate follow-up.

BOUCOT, K. R., AND COOPER, D. A. A Critical Evaluation of Mass Roentgen Surveys. *J.A.M.A.* 142, 16:1255 (Apr. 22), 1950.

This Was New to Me — Do you know all about group oral performance testing? If you face the job of filling one or more responsible positions in your organization, particularly of a supervisory type (in which leadership, alertness, tact, and ability to deal with people count) then you owe it to yourself to know something about this selection method.

BRODY, W., AND MAYO, S. A New Technique for the Selection of Executive Accounting Personnel. *The New York Certified Public Accountant* 20, 4:212 (Apr.), 1950.

How to Report Research—This is a brave and highly successful attempt to reduce the great, complicated cancer research program to a comprehensible and coherent picture of the many causes that conspire to make this the worst of all human plagues.

CAMERON, C. S. Progress in Cancer Research. *Am. J. Nurs.* 50, 4:209 (Apr.), 1950.

Have You an Answer?—Occupational obsolescence sets in at 45 and becomes full blown at 65, yet near-old people like to eat! Each year this economic conundrum grows louder in its insistence upon being answered. Is this public health?

CLAGUE, E. After 45—How about a Job? *Survey* 86, 4:173 (Apr.), 1950.

Words of Wisdom—Good office lighting will more than pay for itself in improved performance, it says here.

CROUCH, C. L. Lighting the Office. *Sight-Saving Rev.* 2, 1:3 (Spring), 1950.

Dentist Speaks to Patient — Limit sticky foods and sweets. Brush teeth directly after meals. Have periodic examinations and cleaning. Use ammoniated dentifrices. Utilize topical applications of sodium fluoride. After all this expense and effort, don't be disgruntled if a few cavities develop.

DIENSTEIN, B. The Cold War on Dental Caries. *J. Am. Dietetic A.* 26, 3:173 (Mar.), 1950.

Ambitious Research — In upper Harlem 194 Negro families were divided into two matched groups. One group received vitamin supplements, the others were the controls. All had been exposed to tuberculosis. Because you should be sufficiently interested in this to want to review the whole paper, I won't dampen your desire for it by summarizing the outcome.

DOWNES, J. An Experiment in the Control of Tuberculosis among Negroes. *Milbank Mem. Fund Quart.* 28, 2:127 (Apr.), 1950.

A What-dun-it? For You—Three large prison epidemics following similar clinical and epidemiologic patterns even to the extent of developing at the same time of day and the same day of the week and all having an unusual cause are reported upon. If that statement doesn't send you scurrying for the paper, then you just haven't the soul of a private eye in you.

TRUSSELL, R. E., *et. al.* Chemical Food Poisoning. *Am. J. Hyg.* 51, 2:142 (Mar.), 1950.

Females Do Better — Almost anything you will ever want to know, statistically, about tuberculosis (up to 1949) is set forth for you here. State death rates varied from 9.5 (Iowa) to 82.4 (Arizona). Largest relative declines have occurred among children. Over age 65 small but consistent *increases* in male death rates continue.

GURALNICK, L., AND GLAZER, S. Tuberculosis Mortality in the United States 1948. *Pub. Health Rep.* 65, 14:468 (Apr. 7), 1950.

Health Education = Communication + Motivation — After a lot of traveling about the country this observer says that we give vehement lip service to community organization but practise an extraordinary denial of it

in the way we attempt to drive people to their health.

Koos, E. L. Community Organization for Health. *Pub. Health Nur.* 42, 4:196 (Apr.), 1950.

They Say, Ignore Negative Weil-Felix—"Definitive" (the term currently so popular with big-word fanciers) is certainly the right one for this treatise on the typhus-like illness that crops up hereabouts among certain immigrants. Part I deals with laboratory diagnosis.

MURRAY, E. S., *et al.* Brill's Disease *J.A.M.A.* 142, 14:1059 (Apr. 8), 1950.

Quote - of - the - Month—"'Never, Never, Never,' in January is a study of the British Health Service based on interviews with discontented doctors and a few slightly inaccurate figures. 'Granny is Gone' in the February number, tells the story of the old lady who died of pneumonia because she could not be found a bed under the National Health Service. Both articles pay little more than lip service to veracity but they encourage the American reader to thank God he is not as other men are and to turn over and go to sleep (Matthew vii, 3)." The quotation refers to two papers appearing in one of our purveyors of surprising health information and written by a university president.

OGILVIE, H. The Granny Racket. *Brit. M. J.* 4655:683 (Mar. 25), 1950.

BCG Research—In a tightly controlled BCG study, infants of tuberculous parents were isolated under exactly the same conditions—some were vaccinated, the rest served as controls. The 131 vaccinated babies were followed for 459 person-years: the 128 controls also for 459. Three of the vaccinated gave x-ray evidence of infection (one was hospitalized and recovered); 6 of the controls were infected—3 died.

ROSENTHAL, S. R. Immunologic Aspects of BCG Vaccination. *J. Pediat.* 36, 4:399 (Apr.), 1950.

Not to Be Missed—There's little about public health in this paper, I confess. But it is the most stimulating discussion of modern-day social headaches that I've come across. It is concerned with the resources of the scientific spirit and ways to put them to work to save man from himself. It assays about a half dozen quotable passages to the paragraph.

SINNOTT, E. W. Ten Million Scientists. *Science* 111, 2876:123 (Feb. 10), 1950.

Organizing Nutrition—This is the problem: public and the professions alike need education in nutrition. There is need for physicians with special training in nutrition, but until an established job is created for these specialists it isn't likely that many will seek the necessary training. This 33 page paper is an effort to foster the demand.

SUBCOMMITTEE OF THE COMMITTEE ON DIAGNOSIS AND PATHOLOGY OF NUTRITIONAL DEFICIENCIES. Nutrition Programs in State Health Departments. *Pub. Health Rep.* 65, 13:411 (Mar. 31), 1950.

ASSOCIATION NEWS

SEVENTY-EIGHTH ANNUAL MEETING
AMERICAN PUBLIC HEALTH ASSOCIATION
ST. LOUIS, MO., OCTOBER 30–NOVEMBER 3, 1950

FELLOWSHIP IN THE AMERICAN PUBLIC HEALTH ASSOCIATION

The grade of Fellowship was established in the American Public Health Association in 1922. Professional workers in public health are eligible for election as Fellows under certain conditions and as an indication that they have achieved a recognized professional standing. As of January 1, 1950, the total membership of the Association was 11,561, including 2,255 Fellows, or 19 per cent of the total.

Questions are frequentliy asked regarding the requirements for Fellowship and the following statement outlines the provisions of the By-laws governing qualification and election.

Persons who have been members of the Association for at least two years and who have reached their 30th birthday are eligible to apply if, in their opinion, they meet the conditions of one or more of the six clauses in the By-laws defining "an established professional standing." These six possible approaches are as follows:

a. A person who has rendered acceptable service for two or more years in a responsible public health position and who has been awarded in course a degree of Doctor of Public Health, Doctor of Science in Public Health, Doctor of Philosophy in Public Health, Doctor of Medicine, with at least one year of graduate study in public health in a university, Master of Public Health, Diploma in Public Health, or other equivalent degrees, according to standards approved by the Executive Board of the American Public Health Association.

b. A person who has been awarded in course an academic or professional degree involving training in public health and who has been regularly engaged in health work for at least five years, having rendered meritorious service as a health officer or in responsible charge of work in either a public or private health agency.

c. A person who has done notable original work in public health or preventive medicine of a character to give him a recognized standing.

d. A person regularly engaged in health work for at least five years, who has given evidence of special proficiency, who has attained a recognized standing.

e. A teacher of public health or one of its constituent sciences who has attained distinction as an expounder of the principles of public health or its constituent sciences. Such a teacher shall have had at least five years' experience as a teacher of public health subjects. Any years of experience as defined in paragraphs "b" and "d" that the applicant may have had shall be considered the equivalent of the same number of years' experience as a "teacher."

f. A person not covered by the above, who has made substantial contributions to public health work in his chosen branch, who has attained a recognized professional standing.

Persons wishing to apply should request a Fellowship application blank from the American Public Health Association Membership Department, 1790 Broadway, New York 19, N. Y. Applications are accepted up to August 1 each year for consideration by the Governing Council at the fall meeting. It is important to make clear that mem-

bers themselves should take the initiative in submitting such applications. Neither the Sections nor the A.P.H.A. administrative staff are authorized to solicit applications. This means that, although over 3,000 persons have been duly recognized with this grade of affiliation since 1922, there are other persons well qualified who have never initiated the process of applying for Fellowships. It should be clear that members should not await action by others if they wish to attain Fellowship. It is necessary and proper for them to take the first step.

An application for Fellowship requires sponsorship by two Fellows of the Section with which the applicant desires to be affiliated. These personal signatures are to be obtained by the applicant before submitting the completed application. The A.P.H.A. office will assist, on request, in determining the Section with which prospective sponsors are affiliated. Applications from persons not wishing to be identified with a particular Section and requesting unaffiliated Fellowship may be sponsored by any two Fellows of the Association.

When properly sponsored and otherwise completed, the application is sent to the A.P.H.A. office, after which the list of persons applying is published in the *American Journal of Public Health*, usually in the September issue, but in any case not less than 15 days before the date for the Annual Meeting. An established routine is followed for review by the Section Councils (unaffiliated applications are reviewed by the Executive Board) and by the Committee on Eligibility. This Standing Committee of the Association is made up of one Fellow from each of the 13 Sections, plus a Chairman elected by the Executive Board. This group is under instructions from the Governing Council to examine each application in accordance with the provisions of the clause of the By-laws chosen by the applicant, and to apply the criteria with precision in each case. Final election is by the Governing Council at the second meeting at each annual session.

The privileges of Fellowship include eligibility to serve as an officer of the Association or one of the Sections, Chairman of an Association or Section Committee (over one hundred in number), a member of one of the four Standing Committees, a member of the Governing Council or Executive Board, and the right to vote for the elective members of the Governing Council and on amendments to the Constitution. Some Civil Service and merit system records depend upon Fellowship in the American Public Health Association as an achievement deserving recognition in applicants.

The dues of Fellows are $12.00 annually, and include a subscription to the *American Journal of Public Health* and other services to which members are eligible. Life membership is available at $200, covering all future annual dues.

Applications for Fellowships to be considered at the 78th Annual Meeting in St. Louis, Missouri, October 30–November 3, should be filed with the Association as soon as they are completed, and in any case not later than August 1. For further information, address the Membership Department, American Public Health Association.

THE 78TH ANNUAL MEETING

St. Louis, Mo., Oct. 30–Nov. 3, 1950

Hotel Reservation Form

The hotels listed below have rooms available for Association delegates at the rates indicated. Please note that no RESERVATIONS WILL BE ACCEPTED DIRECTLY BY HOTELS. Make your reservations through: *HOTELS CONVENTION RESERVATION BUREAU, A.P.H.A., Room 406, 911 Locust St., St. Louis 1, Mo.*

Hotel	*Single Rooms*	*Double Rooms*		*2 Room Suites*
		Double Bed	*Twin Beds*	*Parlor & Bedroom*
American	$2.75–$4.00	$3.50–$5.00	$4.00–$5.00	$8.00
Baltimore	2.75– 3.50	3.75– 4.50	4.00– 5.00	
Broadview	3.00– 6.00	4.50– 7.00	6.00– 8.00	12.00–18.00
Chase	4.00– 8.00	6.00– 8.00	6.00–10.00	10.00–35.00
Claridge	3.25– 4.75	5.00– 7.50	5.50– 7.50	12.00 & up
Congress	4.50– 6.00	6.50– 8.00	6.50– 8.00	12.00–15.00
De Soto	3.50– 5.00	5.50– 8.00	7.00–13.00	12.00–20.00
Forest Park	3.50– 5.00	5.00– 7.00	6.50 & up	10.00 & up
Gatesworth	4.00 & up	5.00 & up	5.00 & up	10.00 & up
Jefferson	4.50– 6.50	6.00– 8.00	7.50– 8.50	12.00–22.50
Kingsway	3.00– 4.00	4.50– 7.00	6.50– 7.00	
Lennox	3.75– 6.00	5.25– 8.00	6.50– 8.00	11.00 & up
Majestic	3.00– 5.00	4.00– 6.00	6.00– 8.00	
Mark Twain	3.25– 5.00	5.00– 7.00	6.50– 7.00	
Mayfair	3.50– 8.50	7.00–10.00	8.00–10.00	12.00–20.00
Melbourne	4.00– 6.00	5.00– 7.50	6.50– 8.00	12.00 & up
Park Plaza	5.00– 9.00	6.00–10.00	7.35–11.00	9.00–30.00
Roosevelt	3.50– 5.00	5.25– 8.50	7.50–12.00	16.50–19.50
Sheraton	4.00– 6.00	3.80– 5.00	6.00	
Statler	3.75– 6.50	4.50– 5.00	5.50– 7.00	
Warwick	2.75– 3.25	5.00– 9.50	7.00 & up	14.00 & up
York	3.00– 4.00	6.00– 8.00	7.00– 9.00	12.00–17.00

Single Rooms are limited; share a twin bedded room with a fellow delegate. Be sure to use the form below giving the Hotels Convention Reservation Bureau the complete information asked for. This will eliminate unnecessary correspondence for you and the Bureau. All reservations will be acknowledged by the Bureau; and confirmed by the Hotel to which you have been assigned by September 1.

ALL RESERVATIONS MUST BE RECEIVED PRIOR TO: September 18, 1950

Hotels Convention Reservation Bureau, A.P.H.A.
Room 406 — 911 Locust St.,
St. Louis 1, Mo.

Please make hotel reservation as indicated below:

First Choice ..... **Second Choice** ..... **Third Choice** .....
(Be sure to give three choices of hotels)
Single Room ..... **Double Bedroom** ..... **Twin Bedded Room** .....
2 Room Suite ..... **Other Type Room** .....
Rate from: $..... **to $**.....
The name(s) of the occupant(s) of the room will be: .....
.....
.....
Arrival at Hotel ..... **hour** ..... **A.M.** ..... **P.M.** .....
(date)
Departure ..... **hour** ..... **A.M.** ..... **P.M.** .....
(date)

***PLEASE NOTE*: Hotel accommodations will be held until 6:00 p.m.; later if deposit is made with notification.**

Name .....
(Individual Requesting Reservation(s))
Address .....
City and State .....

If the hotels of your choice are unable to accept your reservation the Hotels Convention Reservation Bureau will make as good a reservation as possible elsewhere providing that all hotel rooms available have not already been taken.

NOTICE TO A.P.H.A. FELLOWS OF PROPOSED CONSTITUTIONAL AMENDMENTS

The Committee on Constitution and By-laws presents for the information of all Fellows of the American Public Health Association two proposed amendments to the Constitution of the Association. These amendments were approved by the Governing Council in session during the 77th Annual Meeting in New York in October, 1949, and this advance notice to Fellows is given in accordance with Article VIII of the Constitution which requires official publication "not less than thirty days prior to the mailing of the ballots to the Fellows." All Fellows in good standing will have the opportunity to vote on these amendments in a mail ballot in August.

The changes contemplated in the Constitution would extend to members of the Association the right now restricted to Fellows to elect annually ten elective members of the Association Governing Council. The ten elective Councilors are currently elected by the Fellows in a mail ballot. Previous to 1949 they were elected by the Fellows present and voting at the Annual Meeting. Approval of the proposed amendments by the Fellows would permit members to participate annually in the election by mail.

In offering the proposed change for the consideration of all Fellows, the Committee on Constitution and By-laws wishes to remind them that other rights reserved to the Fellows are in no way affected by the proposed amendments. Unchanged are the provisions that:

Only Fellows may vote on amendments to the Constitution

Only Fellows may serve as
- Officers of the Association (except as Vice-Presidents)
- Officers of Sections
- Members of Section Councils
- Members of the Governing Council
- Members of the Executive Board
- Members of Association Standing Committees, the Nominating Committee for Elective Councilors, and the Nominating Committee for Association Officers
- Chairmen of Association or Section Committees
- Sponsors of Fellowship applications

The Committee points out that members are not without certain voting rights in the Sections, where they now may vote for the Section Chairman, Vice-Chairman, and Secretary, and for members of their Section Council. Inasmuch as the Chairman, Vice-Chairman, and Secretary automatically become members of the Governing Council, it can be said that members share with Fellows in electing the three Section representatives on the Governing Council. The composition of the Governing Council includes 39 Section officers, plus the 5 Health Officers Section Councilors, all elected by the members (and Fellows) of each Section. The Committee recognizes, however, that voting by members for Section officers is restricted to members attending the Annual Meeting and that members who do not attend an Annual Meeting do not have an opportunity to vote for their Section officers.

Another group of Governing Councilors in whose election certain members have a vote is the 32 representatives of the Affiliated Societies and Branches, most of whom are elected directly or indirectly by the members of the state societies at the state meetings.

The proposed amendments, whose object is to broaden the voting privileges of members, follow:

Material to be deleted is shown in parentheses; material to be added is in italics.

ARTICLE III MEMBERSHIP Section 2.

The right to hold office, except the office of Vice-President, or to serve as a member of the Governing Council, the Executive Board, or of a Section Council, or of a standing committee, or as the Chairman of a committee of the Association or of a Section, or to vote (for elective Councilors or) on any amendment to the Constitution shall be limited to Fellows

and to Life Members and Honorary Fellows who have been elected Fellows of the Association.

ARTICLE IV GOVERNING COUNCIL COMPOSITION SECTION 1 (e).

Thirty members of the Council, to be elected by the (Fellowship) *Fellows and Members* of the Association, for three year terms, one-third of whose terms shall expire each year. Such members of the Council shall be known as elective Councilors and shall be nominated and elected as provided for in the By-laws. If an elective Councilor is elected a Section Chairman, Vice-Chairman, or Secretary, or an elective member of the Council of the Health Officers Section, or appointed the representative of an Affiliated Society, or of a Regional Branch, a Councilor to fill such vacancy shall be elected by the Governing Council. All vacancies while in office shall be filled by election for the unexpired term. After two consecutive terms, an elective Councilor shall be ineligible for reelection to the Council during one Association year.

Committee on Constitution and By-laws

EDWARD S. GODFREY, M.D., *Chairman*
EARNEST BOYCE, C.E.
PAUL M. DENSEN, D.Sc.
HERBERT G. DYKTOR
FRANKLIN M. FOOTE, M.D.
ALEXANDER D. LANGMUIR, M.D.

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

Alfred Wm. Andreasen, M.D., M.P.H., 201 Trowbridge St., Greenville, Ky., Director, Mulhenburg County Health Dept.

Hans V. Behring, M.D., Bismarckplatz 4, Wiesbaden, Hesse, Germany, Ministerialrat, Inner-Ministry of Hesse

Victor A. Botto, M.D., 615 N. Wolfe St., Baltimore 5, Md., Graduate Student, Johns Hopkins School of Public Health

John B. Bryson, M.D., Tohoku Civil Affairs Region, APO 547, PM, San Francisco, Calif., Asst. Public Health Officer

Clem F. Burnett, Jr., M.D., Old Municipal Bldg., Norfolk, Va., Asst. Director of Public Health, Norfolk Health Dept.

F. R. Chown, M.D., D.P.H., Selkirk Health Unit, Selkirk, Manitoba, Canada, Medical Director

Frank J. Dufner, Jr., M.D., 1305 E. Gold Ave., Albuquerque, N. M., Medical Officer in Charge, USPHS, New Mexico Venereal Disease Intensive Treatment Center

Gilbert L. Dunnahoo, M.D., 8411 Irvington Ave., Bethesda, Md., Chief, Division of Foreign Quarantine, USPHS

Dennis H. Groome, M.D., M.P.H., 424 Rosa Ave., New Orleans 20, La., Venereal Disease Control Officer, Acting Chief, V-D Section, State Dept. of Health

Albert W. Hilberg, M.D., State Univ. of Iowa Medical College, Pathology Dept., Iowa City, Iowa, Senior Asst. Surgeon(R), Technical Services Branch, National Cancer Institute

George G. Holdt, M.D., 208 Post Office Bldg., San Diego 1, Calif., Medical Officer in Charge, USPHS

Roy P. Lindgren, M.D., Boston Health Dept., Haymarket Square, Boston, Mass., Acting Director, Division of Tuberculosis

Walter R. Martin, M.D., 501 Greene St., Augusta, Ga., Asst. Commissioner of Health, Richmond County Health Dept.

John R. Murdock, M.D., 5101 Manning Place, N.W., Washington, D. C., Asst. Director, Pan American Sanitary Bureau, Regional Office of the World Health Organization

J. M. O'Keefe, M.D., Stonewall Local Health Unit, Stonewall, Manitoba, Canada, Medical Director

Paul D. Pedersen, M.D., District Health Office, Sikeston, Mo., District Health Officer

Russell I. Pierce, M.D., M.S.P.H., 2300 Connecticut Ave. N. W., Washington, D. C., Chief, Radiology Branch, Division of Tuberculosis, USPHS

William A. Prowse, M.D., C.M., 468 Summerhill Ave., Apt. 3, Toronto 5, Ontario, Canada, Medical Officer, Royal Canadian Air Force

James C. Spalding, M.D., 2411 First St., Brownwood, Tex., Director, Brownwood-Brown Co., Health Unit

Carl F. Tarlowski, M.D., 1077 Old Orchard Lane, Beaverton, Ore., Deputy Health Officer, Washington-Yamhill District Health Dept.

Fred W. Thyng, M.D., Battey State Hospital, Rome, Ga., Tuberculosis Control Clinician, USPHS

John H. Tiedemann, M.D., P. O. Box 3027,

Avondale Station, Birmingham 6, Ala., S.A. Surgeon(R), USPHS

J. L. Turnage, M.D., 520 South Natchez, Kosciusko, Miss., Director, Attala Leake Health Dept.

Rafael S. Vazquez, M.D., P. O. Box 483, Manati, Puerto Rico, Director, Public Health Unit of Manati, Health Dept. of Puerto Rico

Robert J. Walker, Jr., M.D., Sunset Apts., Apt. 12c, Rocky Mount, N. C., City Health Officer

William Watt, M.B., D.P.H., Neepawa Local Health Unit, Neepawa, Manitoba, Canada, Medical Director

Langdon R. White, M.D., American Consulate General, Montreal, Canada, Medical Officer in Charge, USPHS

Richard H. Wilcox, M.D., M.P.H., 431 SE 3rd, Pendleton, Ore., Health Officer, Umatilla County Health Dept.

Laboratory Section

Joseph R. Darnell, M.T., P. O. Box 208, Weiser, Ida., Laboratory Technician, Memorial Hospital

Robert J. Dings, 2001 Haste St., Berkeley 4, Calif., Bacteriologist, Placer County Health Dept.

Morris A. Gordon, Ph.D., Mycology Unit, Communicable Disease Center, USPHS, Chamblee, Ga., Senior Asst. Scientist(R)

Karl Habel, M.D., 8590 Locust Hill Rd., Bethesda 14, Md., Chief, Laboratory of Infectious Diseases, National Institutes of Health

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The Circulation Department of the Association office finds itself short of certain issues of the JOURNAL. It will be appreciated if members who can spare them will send collect to 1790 Broadway, New York 19, N. Y.:

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EMPLOYMENT SERVICE

The following pages present information for those seeking qualified public health personnel and for those seeking positions in public health.

This is a service of the Association conducted without expense to the employer or employee.

POSITIONS AVAILABLE

Director of Dental Health, well organized program, 1 stationary clinic and portable equipment for sodium fluoride treatments in the schools. Beginning salary $6,000 annually plus 6¢ mileage allowance. Junius B. Johnson, D.D.S., City-County Health Dept., 241 W. South St., Kalamazoo, Mich.

Director of Public Health Nursing—Bachelor's degree from accredited college or university; graduate from approved school of nursing; 1 year's approved study in public health nursing; 6 years of public health nursing including 3 years' supervisory experience. Entrance salary $4,800 plus liberal travel allowance. North Dakota State Dept. of Health, Bismarck, N. D.

Supervisor of Nurses—Newly organized County Health Department. Salary $4,200; 40 hour week; mileage allowance, must have own car. Qualifications as set up by N.O.P.H.N. Victor H. Hough, M.D., County Health Officer, Inyo County Health Dept., Independence, Calif.

Bacteriologist–Assistant Professor, Department of Microbiology and Public Health, midwestern Medical School. Facilities and funds for half-time research. Young Ph.D. preferred. Must have excellent background in medical bacteriology and immunology. Salary open. **Box A-86,** Employment Service, A.P.H.A.

County Health Officer for central Illinois county of 37,000. Plans under way to combine with another county to make health jurisdiction of 50,000. Salary range $7,500 to $9,800. W. H. Newcomb, M.D., President, Morgan Co. Board of Health, Professional Bldg., Jacksonville, Ill.

District Health Officer for district of approximately 250,000 people with training center. Salary $6,000 to $7,200 depending upon training and experience, automobile allowance, $900 yearly. Cook Co. Dept. of Public Health, 737 So. Wolcott Ave., Chicago 12, Ill.

Industrial Hygiene Engineers for California State Dept. of Public Health. Two years' experience in general engineering, one of which shall be in public health engineering, plus college with engineering major. One year postgraduate course in public health engineering may be substituted for one year required experience. Official application must be filed by June 24. Write to Recruitment Section, State Personnel Board, 1015 L Street, Sacramento, Calif.

Public Health Physician for District Office of State Health Department, Southern Illinois, University town. Salary $5,760–$7,656 with possibility for promotion for capable individual. Civil Service and Retirement System.

Public Health Physician for Assistant Chief, Division of Local Health Administration, State Department of Public Health. Present salary range $480–$638 monthly. May start above minimum.

Public Health Physician for Champaign-Urbana Public Health District. Population 48,000. Salary range $7,500–$9,000. University cities. Competitive examination planned for late summer.

For information on above three openings write to Roland R. Cross, M.D., Director, State Department of Public Health, Springfield, Ill.

Director, Division of Tuberculosis Control, New Mexico Dept. of Public Health. Organization and direction of a statewide program of tuberculosis control. Minimum qualifications: graduation from grade medical school plus at least 3 years of postgraduate training and experience in the diagnosis and treatment of tuberculosis. Merit System Council, Box 939, Santa Fe, N. M. for official application blank.

Public Health Physician as Health officer of a new single County Health Dept. beginning July 1. Opportunity of organizing first staff and programs. County of 20,000 on Mississippi River in northwestern Illinois. Salary range $7,200–$9,000. Qualified health officer may start above minimum. G. Alzeno, D.D.S., President, JoDaviess Co. Board of Health, Stockton, Ill.

Supervisors and Public Health Nurses, population 252,000; suburban, industrialized and rural areas; county seat 8 miles from Baltimore. Generalized service including progressive school heath program; 50 field nurses. 1 month's vacation; 5 day, 35½ hour week; sick leave; retirement plan. For use of personal car, allowance

of 7¢ per mile. Supervisor: degree and experience required; beginning salary $3,400 to $3,900, depending on qualifications; additional preparation in field of education, tuberculosis, orthopedics or mental hygiene preferred. Public Health Nurses, beginning salary $2,300 (for trainee) to $2,700 depending on experience and education. Dr. William H. F. Warthen, Health Officer, Baltimore County Health Dept., Towson 4, Md.

Health Officer for generalized program in county of 35,000, 100 miles west of Chicago. Salary range $7,200–$9,000 with $65 per month travel allowance. Retirement system; 3 weeks' vacation; 2 weeks' sick leave. President, Lee County Board of Health, Dixon, Ill.

Physician trained in industrial medicine and industrial hygiene. Will be employed half-time in Government industrial installation and half-time with medical clinic group. **Box A-87,** Employment Service, A.P.H.A.

Public Health Nurse. Salary range $250–$290 per month according to educational qualifications and years of experience; 39 hour week; generalized program; opportunity for advancement. Spokane Visiting Nurse Assn., Rm. 605 City Hall, Spokane, Wash.

POSITIONS WANTED

Public Health Dentist, M.P.H., 33, experienced in directing public health dental programs; 3 years' experience in clinical dentistry in Army. Desires public health dental position at state or local level. **Box D-1,** Employment Service, A.P.H.A.

Public Health Physician, male, 40, M.P.H., certified by American Board of Preventive Medicine and Public Health. At present employed as public health administrator in metropolitan health department and assistant professor of preventive medicine in university medical school. Previous experience as rural county health officer and medical care administrator and in clinical medicine. Interested in responsible position with forward looking official or voluntary agency. **Box Ph-20,** Employment Service, A.P.H.A.

Opportunities in Alaska

Senior Public Health Nurses, Public Health Nurse-Midwives, and Public Health Nurses for Alaska Department of Health

Immediate openings for qualified individuals. Minimum qualifications for Senior Public Health Nurse: graduation from accredited school of nursing; completion of program of study in public health nursing approved by NOPHN; two years' experience in a generalized public health nursing service. Public Health Nurse-Midwife: graduation from an accredited school of nursing; completion of a program of study in public health approved by NOPHN; completion of a program of study in midwifery defined by NLNE, and 1 year generalized public health nursing experience. Public Health Nurse: graduation from an accredited school of nursing; completion of a program of study in public health nursing, 1 year of supervised public health nursing experience. Base salaries: Senior Public Health Nurse and Public Health Nurse-Midwife, $385 per month. For Public Health Nurse, $370 per month. In certain areas where the cost of living is higher, 15 per cent more is allowed above the salary stated. For information, write Dorothy K. Whitney, Director of Nursing, Dept. of Public Health, Box 1931, Juneau, Alaska.

Announcements

Open Competitive Examination
Public Health Nurse—City of Hartford, Conn.

Open to resident citizens of the United States. Successful applicant will be required to take up residence in Hartford. Closing date: Applications will be accepted until a sufficient number of candidates have filed for examination. Salary Range $2,712–$3,264. Applications should be filed with City of Hartford, Dept. of Personnel, 550 Main St., Hartford, Conn.

U. S. Civil Service Commission
Examination for position of Public Health Nutritionist
Salary: $4,479 to $7,432

Applications for the above examination will be accepted until further notice. Basic requirements are: Successful completion of a full 4 year course leading to a bachelor's degree including courses in foods, nutrition, chemistry, biology, and dietetics, or at least 4 years of responsible experience as a nutritionist in the field of public health. Length of experience in addition to meeting basic requirements: P-3, 2 years; P-4, 3 years; P-5, 3 years; P-6, 3 years. For further information and application forms write to any first- or second-class post office. Forms may also be obtained from the U. S. Civil Service Commission, Washington 25, D. C.

Advertisement

All communications should be sent to Burneice Larson, Medical Bureau, Palmolive Building, Chicago 11, Ill.

Opportunities Available

PHYSICIANS WANTED—(a) Deputy commissioner of preventive medicine; key appointment requiring outstanding public health administrator; $8,000–$10,000; state department of health. (b) Director of student health department, one of country's largest universities; department well staffed; outstanding opportunity. (c) Public health physician to direct department serving county of 7,200 square miles with twelve incorporated cities; graduate training and several years' administrative public health experience desirable; Pacific Coast. (d) Director of metropolitan health department; university city of 200,000, East; $9,000 with periodic increases to $12,000. (e) Director of tuberculosis control and, also, assistant health officer; large, eastern city, university medical center; outstanding men required; minimum starting salaries, $9,000; periodic increases. (f) Public health physician to direct school health program; large winter resort city; Southwest. (g) Public health internist for opening in heart disease program, clinical psychiatrist for children's clinic, child hygiene physician and epidemiologist; state health department with expansion program; East. **PH6-1**

PUBLIC HEALTH NURSES WANTED—(a) Director of public health nurses; town of 80,000 located on Lake Michigan. (b) Director of student health and recreational activities; large, general hospital; university city, East. (c) Public health nurse to serve as supervisor of nurses; county health department; generalized program; delightful location, California; around $4,800. (d) Public health nurse to direct educational program; college town, South. (e) Director of public health nursing program; outstanding opportunity with eastern university. (f) Director, county health department; Chicago area. **PH6-2**

WANTED—(a) Health educator and, also, nutritionist; new heart disease control program; county-city health department. (b) Public health engineer; preferably B.S. from college of engineering with academic training in sanitary engineering; minimum three years' experience, preferably in tropical or backward countries; Arabia; minimum $6,000, maintenance, other prerequisites. (c) Health educator or public health nurse to serve as coördinator for cerebral palsy nursery, large teaching hospital; approximately fifteen children; well staffed department; Middle West; $5,000. (d) Health educator; duties consist of producing material in field of health; offices in headquarters of one of leading national professional organizations. (e) Two sanitarians; county health department; East. (f) Health educator to serve as curator of education; ability to organize community program, conduct conferences, institutes required; man preferred; large city, university medical center. (g) Health educator; interesting location outside Continental United States. (h) Health educator to develop educational material (pamphlets, radio material, etc.) regarding problems of chronic illnesses so as to enable department or community to conduct health campaigns. **PH6-3.**

Opportunities Wanted

Health Educator; M.S., D.P.H.,; one year, research fellow, and two years, teaching fellow, university school of public health; five years, associate professor of hygiene and public health; several years, director, health education, state department of health; for further information, please write Burneice Larson, Medical Bureau, Palmolive Building, Chicago.

Public health dentist; D.D.S., M.S.D. (Children's Dentistry); M.P.H. (Public Health); several years' teaching experience; has had considerable research on dental caries; for further information, please write Burneice Larson, Medical Bureau, Palmolive Building, Chicago.

Public health nurse is available for administrative position; graduate of five year public health nursing course; B.S., Simmons; M.P.H., eastern university; three years, director health education, state university; eight years executive experience in public health nursing; for further information, please write Burneice Larson, Medical Bureau, Palmolive Building, Chicago.

Public health physician; Master's in Public Health, Johns Hopkins; five years, county health officer; six years, director, metropolitan department of health; certified by American Board of Preventive Medicine and Public Health; for further information, please write Burneice Larson, Medical Bureau, Palmolive Building, Chicago.

Sanitary engineer; M.S. degree, Public Health, University of Michigan; three years, malaria control and sanitation, foreign country; four years, sanitarian, county health department; for further information, please write Burneice Larson, Medical Bureau, Palmolive Building, Chicago.

NEWS FROM THE FIELD

NATIONAL CONFERENCE ON CARDIOVASCULAR DISEASES

The National Conference on Cardiovascular Diseases under the auspices of the American Heart Association and the National Heart Institute, U. S. Public Health Service, was held in Washington, D. C., January 18–20. The declared purpose of the conference was:

> To investigate, define, and develop immediate and long-range programs designed to meet the problems of research, education, and community service posed by diseases of the heart and circulation, and to coördinate the efforts of all groups concerned with these problems with a view to gaining the most effective use of their resources for all the members of the community.

In the opinion of one observer, the Conference achieved these goals in a greater degree than could reasonably have been hoped for. It was generally regarded as "a unique conference which will be a milestone in America's health."

About 300 physicians, scientists, educators, and other health and community workers attended and worked intensely for three days. They themselves built the programs, the outlines, statements, catalogues, and even manuals which will be available in the conference report. The plan of the conference practically excluded addresses, the work being done through small problem-solving committees, using the discussion techniques. A keynote address was presented by Harold M. Marvin, M.D., President of the American Heart Association. The closing address was given by Frank G. Boudreau, M.D., and the conference was summarized by Abel Wolman, Dr.Eng.

Elaborate and detailed planning took place before the conference, deliberately utilizing conference techniques that involved participation of many persons. An extension of these methods resulted in the preparation of factual data regarding present knowledge in each of the major areas of cardiovascular diseases and several minor areas. Some 20 scientists prepared statements regarding present and potential contributions to cardiovascular diseases.

The conference was organized under three sections as follows:

Section I—Technical Knowledge and Research, T. Duckett Jones, M.D., and Louis N. Katz, M.D., Co-Chairmen

Section II—Community Services, Leonard W. Mayo, S.Sc.D.

Section III—Professional Education, Dorothy B. Nyswander, Ph.D.

Among the questions with which the committees wrestled were:

What is known about the various cardiovascular diseases?

What needs to be known?

What research is needed?

How are epidemiology and case finding applied?

Outline a plan of patient treatment and case management applicable to the overall community problem.

What is the role of the nurse and what are the needs in cardiovascular disease control in regard to nursing?

What are the needs and how may they be met in professional education for cardiovascular diseases?

How can the services, facilities, etc., in a community be integrated?

According to one observer "A prevalent feeling of pessimism toward cardiovascular diseases was transformed into an active optimism, an urge for action with new practical tools."

An eminent clinician reported publicly that he had approached the conference with strong feelings of hostility and futility. However, he confessed that he developed interest, tolerance, and admiration and respect for other members, for their disciplines and for the method of the conference.

There was strong insistence throughout the conference that the cardiovascular disease program should be an integral part of the total community health program.

HUMAN HABITATION STANDARDS

Minimum standards of fitness for human habitation have been established by the Massachusetts Department of Public Health. They become effective locally upon acceptance of the standards by any city or town. Enforcement rests with the appropriate local health official or board. Two categories of standards are established, "A" and "B"; the former referring to such items as number of occupants, garbage disposal, vermin infestation, water supply, sewage disposal, etc.; the latter to cleanliness, repair and serviceability, heating, etc. Violation of any "A," or any two or more "B" regulations, constitutes "sufficient reason for finding unfit for human habitation a building or any portion thereof. . . ."

POPULARIZING WATER POLLUTION REPORTS

A Reports Analysis and Statistics Branch of the Division of Water Pollution Control has been organized by the U. S. Public Health Service. The Branch will translate for popular use the technical reports of water pollution currently being compiled by engineers in the water pollution control agency in each state. Perry R. Taylor serves as chief of the Branch in addition to his duties as executive officer of the Water Pollution Control Advisory Board. He will be assisted by Russell Lord, a special consultant, who is editor of *The Land*, a quarterly magazine published by Friends of the Land.

1950 PASSANO FOUNDATION AWARD

The Passano Foundation $5,000 cash award for 1950 has been conferred upon Drs. Edward C. Kendall and Philip S. Hench of the Mayo Clinic, Rochester, Minn., for their chemical investigation of the adrenal cortical hormones, the development of cortisone and its clinical application to the rheumatic diseases. Drs. Kendall and Hench jointly received an A.P.H.A. Lasker Award in 1949 for their contributions to the development of cortisone. The award will be presented at the annual award dinner of the Foundation to be held at the St. Francis Hotel, San Francisco on June 28, during the annual meeting of the American Medical Association.

COMMUNITY TUBERCULOSIS PROGRAM

An extensive tuberculosis control program has been carried on the past 4 years in Columbus, Muscogee County, Ga. In 1946 the County Health Department, assisted by the State Health Department and the U. S. Public Health Service, established a coöperative facility with the purpose of combining effective tuberculosis control and a study of the epidemiology of the disease in this community. For six weeks every person in the County over 12 years of age was offered a blood test and chest x-ray and over 50,000 received these tests. BCG vaccination was offered to school children under controlled circumstances. The 1946 survey has been fully described by George W. Comstock, M.D., tuberculosis control officer of the County Health Department and director of the Study, in *Public Health Reports*, March 4, 1949.

A follow-up program is currently being conducted in Muscogee County to evaluate the place of the 1946 x-ray survey in the control of tuberculosis, to determine the incidence of tuberculosis in the four years between the surveys, and to study the manner of spread of the disease through the community. At the same time, the project will study the comparative measurements of tuberculin sensitivity, so that the prevalence of infection in the various demographic

groups may be determined. The cases developing after 1950 will be related to their tuberculin sensitivity in order to chart the development of the disease among positive and negative reactors.

BCG vaccination has been introduced into the present program on a controlled basis, with the prospect of evaluating the results in a few years. At the same time, it will afford an opportunity to study the administrative feasibility of combining mass x-ray surveys with vaccination programs. In this year's survey, BCG vaccination is being offered to the entire population of the county, numbering 100,000. Tuberculin testing and vaccination are being performed by nurses from the Public Health Service, using uniform techniques and recording procedures. Vaccine arrives by air twice each week from Chicago and is used within five days of its manufacture.

$500,000 TO BEAT THE COMMON COLD

The Harvard Medical School has received a bequest of a half million dollars for research in finding a cure for the common cold. Any residue left in the fund after a definite cure is found is to be paid over to the Harvard Corporation. The bequest was made by the late Paul V. Bacan, textbook publisher of Wellesley, Mass.

MEASURING SMOKE CONCENTRATION

"A Simplified Method for Computing the Concentration at Ground Level of Smoke and Dust Issuing from a Stack," by associate professor J. M. DallaValle, Georgia Institute of Technology, Atlanta, presents a graphic method for measuring the diffusion of various size particles downwind from stacks. Further information from Prof. DallaValle.

SCIENTIFIC RESEARCH SOCIETY

The sixth branch of the Scientific Research Society of America to be established in the United States was recently installed at the Communicable Disease Center, U. S. Public Health Service. Ninety-three charter members belong to the new Atlanta branch. Dr. R. A. Vonderlehr, medical director in charge of the Communicable Disease Center, has been elected the first president. Dr. Ralph T. Overman, Chairman, special training division, Oak Ridge Institute of Nuclear Studies, spoke on nuclear science in public health at the installation ceremonies.

NATIONAL HEALTH COUNCIL MEETS

Approximately 300 persons attended the annual luncheon of the National Health Council at the Roosevelt Hotel, New York City, on March 24 and heard Willard C. Rappleye, M.D., Dean of Columbia University College of Physicians and Surgeons, discuss problems of medical and public health personnel. Dr. Rappleye stated that, "the need is for better, rather than more, doctors, and for keeping practising physicians abreast of new knowledge and methods." He pointed out that the total number of additions to the medical profession annually is now higher than 5,600 and that the ratio of doctors to population during the next 30 years will continue to rise because the number of physicians from existing medical schools is increasing at a rate greater than that of the general population.

At this 30th annual meeting of the Council, developments in multiple case finding were described by A. L. Chapman, M.D., of the U. S. Public Health Service, and others in a symposium on the common denominators of early case finding. Others who took part in the symposium were:

Brewster S. Miller, M.D., American Cancer Society

Howard F. Root, M.D., American Diabetes Association

David D. Rutstein, M.D., American Heart Association

Franklin M. Foote, M.D., National Society for the Prevention of Blindness

Floyd M. Feldmann, M.D., National Tuberculosis Association.

Ernest L. Stebbins, M.D., Director of the Johns Hopkins University School of Hygiene and Public Health, was elected president of the Council to succeed Philip R. Mather of Boston, president for the past four years. Mr. Mather was elected treasurer; Mrs. Oswald B. Lord, vice president; Herbert I. Wood, assistant treasurer; James E. Perkins, M.D., managing director of the National Tuberculosis Association, was reëlected secretary.

Newly elected members of the Board of Directors include:

David T. Smith, M.D., Durham, N. C.
F. C. Beelman, M.D., Kansas State Health Officer
Harold Hillenbrand, D.D.S., general secretary, American Dental Association
Louis H. Bauer, M.D., Hempstead, L. I.
L. E. Burney, M.D., Indiana State Health Officer
Mildred Elson, executive secretary, American Physical Therapy Association
Mrs. Albert L. Gardner, Fords, N. J.
Allen O. Gruebbel, D.D.S., American Dental Association
Mrs. Peter Miller, Washington, D. C.
Carl M. Owen, New York City
Howard F. Root, M.D., Boston
Leonard A. Scheele, Surgeon General, U. S. Public Health Service
Charles E. Scribner, New York City
Gerard M. Ungaro, Chicago.

NEW ENGLAND HEALTH INSTITUTE

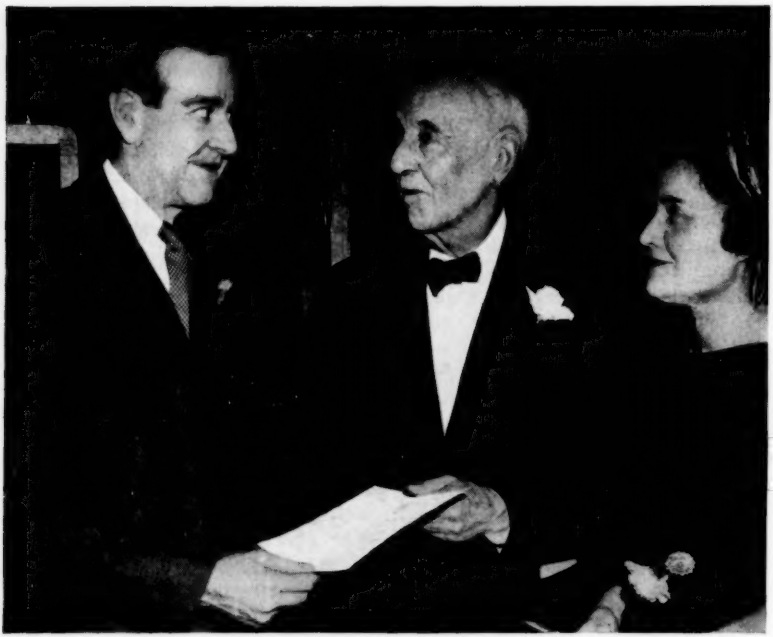
The 1950 New England Health Institute will be held at the University of Massachusetts, Amherst, June 14–16, in coöperation with the Massachusetts Public Health Association and the Massachusetts Public Health Conference. Among the panel discussants on the subject "The Health Dollar—Are We Shortchanging Ourselves?" will be Roscoe P. Kandle, M.D., Field Director, American Public Health Association and William J. Deegan, city manager of Quincy, and Hugh Leavell, M.D., of the Harvard School of Public Health as summarizer. The evening session will be devoted to "What Do Women Want from Public Health?" Discussants will be Mrs. Stephen Francisco, Welfare Chairman of the General Federation of Women's Clubs, and K. Frances Scott, M.D., President, National Federation of Business and Professional Women's Clubs.

Thomas D. Dublin, M.D., Executive Director of the National Health Council, is the luncheon speaker on "Health Councils, 1950 Model." Mark D. Hollis, Chief, Sanitary Engineering Division, U. S. Public Health Service, will give a paper on "What's New in Environmental Sanitation?" C.-E. A. Winslow, Professor Emeritus of Public Health, Yale University, will end the sessions with a "Conference Round-Up."

POINT FOUR PLANS ON HEALTH

The U. S. Public Health Service through the Surgeon General, Leonard A. Scheele, recently announced tentative plans for a Point Four technical assistance program in health. About 300 experts would be put in the field, about 60 per cent detailed to the multilateral program conducted by WHO, about 40 per cent in bilateral programs between the United States and other countries. The assistance would be given chiefly in tropical countries but nowhere except on request of the country aided.

This program is predicated on a Point Four Program of from $35,000,000 to $45,000,000, with about one-fourth devoted to health. It would broaden greatly United States participation in world health problems which is now limited to five projects: a Liberian mission because of a military base there, a mission to Greece, a research project in Peru, a research project studying leishmaniasis in Paraguay, and a survey team to Iran in which a team of three serves as consultants on health education.



Left to Right: Dr. Leavell, Chairman, Award Committee, Dr. Winslow, recipient, and Dr. Mary E. Spencer, President, Massachusetts Public Health Asociation

PROFESSOR WINSLOW RECEIVES SHATTUCK AWARD, 1950

As a feature of the 60th Anniversary celebration of the Massachusetts Public Health Association, the Lemuel Shattuck Award was created to recognize outstanding leadership in public health. On April 25 the Award was presented to Professor C.-E. A. Winslow of Yale University by Hugh R. Leavell, M.D., Professor of Public Health Practice at the Harvard School of Public Health, Boston. The citation follows:

Charles-Edward Amory Winslow, native son of New England and worthy successor of Shattuck, Sedgwick, and its other public health immortals, the Massachusetts Public Health Association on its Sixtieth Anniversary, is proud to have you receive the first Lemuel Shattuck Award on the one hundredth anniversary of Shattuck's great report.

New laurels could be added to those you already possess only by creating a new honor. In presenting to you the Sedgwick Medal, its highest prize, the American Public Health Association named you, "Friend of the poor and disadvantaged, standard bearer of Christian ideals in human relations, persistent searcher for the truth of causes and effects of human survival at ever higher levels." In recognition of your "distinguished services in advancing the knowledge of the relationship and understanding of man and his environment" as "physiologist, research director, teacher, adviser and author," the American Society of Heating and Ventilating Engineers gave you its coveted F. Paul Anderson Medal. You have been called to fill the presidential chair of nearly every professional society or other group of which you are a member.

All these distinctions represent man's efforts to express his appreciation for the great services you have done him. Unlocking secrets of man's environment, you have been ever mindful of man himself. Contributing new knowledge to scientific annals yourself, as editor, you have pointed to the significance of work done by others. Inspiring your students as a great teacher, you have gloried in their achieve-

ments. Outstanding in your own country, you have given other nations the finest sort of help. Making history by your own achievements, you have unravelled and made fascinating the historical development of public health itself.

Your inspired leadership in many fields has made the work of others a challenging career rather than simply a job to be done.

Fortunately, one need not speculate as to whether all this might have been accomplished had not Mrs. Winslow been so constantly at your side. We know you both as an incomparable team, each contributing factors essential to the whole.

We honor you for all these and other contributions you have so generously made. In addition we honor you for the fame you bring New England as its native son, and to the Massachusetts Public Health Association of which you were an early member.

WHO BRIEFS

The Executive Committee of the Pan American Sanitary Bureau, the WHO Regional Office for the Americas, at its April meeting approved a 1951 budget of nearly $2,000,000, about one-third of which was earmarked for campaigns against communicable diseases.

The 3rd World Health Assembly opened on May 8 in the grand Assembly Hall of the Palais des Nations at Geneva.

WHO experts have completed a survey of the incidence of malaria and the venereal diseases in Afghanistan, and a malaria unit is for the first time demonstrating methods of control with modern insecticides in one district. Afghanistan is reported to have just over 100 qualified doctors for a population of 12 million persons.

Czechoslovakia in April announced its withdrawal from WHO, making the 6th of the east European countries to take such action. A summary of WHO activities in Czechoslovakia indicates that since 1947 WHO assisted in tuberculosis and venereal disease campaigns and in the rehabilitation of an UNRRA penicillin plant, has granted 62 fellowships permitting senior personnel to study abroad in countries including Russia, aided in building a new State Medical Library, and had 1950 plans for opening a training center for anesthetists and for sending a Swedish team to demonstrate new techniques in the treatment of congenital heart disease, including "blue baby" operations.

Indonesia and Viet Nam have applied for membership in WHO.

The United Kingdom has requested associate membership in WHO for Southern Rhodesia, the first such application to be received. Such membership is granted to territories not responsible for the conduct of their international relations.

A list of vaccination certificates required in 108 countries and territories from travellers coming from other countries has been published by WHO. Steps are being taken to simplify these formalities.

WHO's Expert Committee on the Unification of Pharmacopoeia held its 6th meeting in New York City on April 28. This committee is nearing the completion of its work for a first volume of an *International Pharmacopoeia*. This will contain descriptions and standards for some 200 drugs in general use which are ordered by doctors for their patients. The problem is highlighted in this sentence from a WHO publication, "If a traveler visiting four different countries tried to buy the new antimalaria drug Paludrine, he might have to ask for it by as many as 10 different names."

The following new appointments have been made to WHO Geneva headquarters staff: Dr. Marcolina Candau of Brazil as Director of the Division of Public Health Administration. Dr. Candau has been Superintendent of the S.E.S.P. of Brazil, working in coöperation with the Institute of Inter-American Affairs. He is currently a Vice-President of the American Public Health Associa-

tion. He has been succeeded as Superintendent of S.E.S.P. by Dr. Ernani Braga who received his M.P.H. from the Columbia University School of Public Health, New York, in 1948.

Dr. Victor Sutter of Brazil who has also been serving with S.E.S.P. in Brazil is Director of the Division of Communicable Diseases.

INSTITUTE OF NUTRITION AWARDS

At its annual meeting in Atlantic City in April, three science awards were made by the American Institute of Nutrition. This is a national organization of research scientists whose work is directed primarily toward the solution of basic problems in human and animal nutrition.

Conrad A. Elvehjem, Ph.D., Professor of Biochemistry at the University of Wisconsin, received the Osborne and Mendel Award "in recognition of his contributions to our knowledge of the vitamin and amino acid requirements of experimental animals." This research discovered niacin, the anti-pellagra vitamin, which is basic to the protection of human health and successful agriculture, the world over. Recipient of the Mead Johnson Vitamin B-complex Award for 1950 is William B. Castle, M.D., of the Harvard University Medical School, "in recognition of his classic investigations leading to the concept of intrinsic and extrinsic factors in pernicious anemia, and of his studies elucidating the relation of vitamin B_{12} to this concept." The 1950 Borden Award in Nutrition was presented to Henry C. Sherman, Ph.D., Professor Emeritus at Columbia University, "for research emphasizing the nutritive importance of components of dairy products."

A NEW TRAINING TECHNIQUE

"Science and education have no boundaries," is the explanation for the telephone extension program of the University of Illinois College of Dentistry. This program is outlined in a handsome paper-bound manual, *Current Advances in Dentistry*, published by the college, which gives the content of six round table discussions presented via telephone. This program began with an experiment in 1947 when a course in caries control was transmitted by telephone from the classroom in Chicago to a group of dentists in Scranton, Pa. In 1948, courses were given to dentists in 6 Illinois cities and New Iberia, La. In 1949, dentists in 138 cities and 33 educators were involved in the program.

FEDERAL HELP TO MEDICAL RESEARCH

Since the program was instituted in 1938, a total of more than $36 million has been contributed by the federal government through the U. S. Public Health Service, Division of Research Grants, for the prosecution of medical research. This fact, together with an analysis of geographical distribution of research grants and fellowships, their correlation with research potential and with men of science, is reported in detail in the Autumn issue, 1949, of *American Scientist*, Vol. 37, No. 4. Frank W. Reynolds and David Price of the Public Health Service are the authors. Reprints of their article are available without charge from the Division of Research Grants and Fellowships, National Institutes of Health, Washington, D. C.

CROSSVILLE, TENN., MEDICAL CENTER

The first unit in Tennessee's construction under the Federal-State Hospital and Health Center Program was opened in Crossville in Cumberland County, where the $705,000 center was opened on March 19.

The history of this enterprise goes back 30 years to the beginning of the work when Dr. May C. Wharton with the aid of two loyal associates who are still with her opened a two bed hospital in a private dwelling. Dr. Wharton with Elizabeth Fletcher and Alice Adshead, R.N., developed the program with

the support of voluntary funds, and there were gradually included outpatient clinic services, public health nursing and school health services. State funds contributed to the progress and development. Now the new hospital of 50 beds of efficient modern construction has been opened through the aid of federal, state, and local money.

1950 SURVEY AWARD TO MISS LENROOT

The 1950 Survey Award presented by the publishers of the *Survey Magazine* for achievement in the fields of public health and social welfare was presented to Katharine F. Lenroot, Chief of the U. S. Children's Bureau, Federal Security Agency, Washington, on April 24 at the National Conference of Social Work in Atlantic City. Dr. Leonard W. Mayo, Chairman of the Award Committee, presented the Award plaque. Miss Lenroot, a native of Wisconsin, has been associated with the Children's Bureau since 1915 and as Chief since 1934. She is a Fellow of the Maternal and Child Health Section, American Public Health Association.

DR. BAILLIE JOINS BELL OF CANADA

James H. Baillie, M.D., D.P.H., who has served since 1945 as Executive Director of the Canadian Public Health Association, Toronto, has been appointed Assistant Medical Director of the Bell Telephone Company, Canada, with offices in Toronto. Dr. Baillie will be in charge of health services in the Toronto area and of the coördination of these services throughout the major part of Ontario. Dr. Baillie is a Trustee of the American Board of Preventive Medicine and Public Health, Inc.

NEW YORK COUNTY LIBRARY UNIT LAW

An act passed by the 1950 Legislature of New York provides for state aid to local libraries. For the first year a million dollars was appropriated but an ultimate annual state cost of $3,653,000 is expected. One of the major purposes of the law is to encourage libraries to federate into systems serving entire counties or groups of counties. In such systems, the books and periodicals in any library would be available to readers in other members of the federation. County systems, when approved as to standards, by the state commissioner of education, are entitled to state aid for book and periodical purchases of 15 cents per capita of population up to one-half such expenditures. If the federation also has central purchasing and rebinding facilities, it is further entitled to 7½ cents per capita of state aid up to one-fourth of its outlay for such purposes.

MINNESOTA MENTAL HEALTH BULLETIN

Mental Health Progress, a four page bulletin is a new joint project of the Minnesota Department of Health and the state university. It first appeared March 1 and will be published monthly except during July and August. It will present a summary of the developments in the field of mental health with special emphasis on preventive and educational work.

CUBAN HEALTHMOBILES

The Cuban Ministry of Health has received its first specially designed motor coach that will give medical and dental services to 100,000 children in poor rural areas, where hospital, medical, and dental facilities are lacking. Particular attention will be paid to tests for tuberculosis and blood and skin diseases. A total of 108 mobile health units have been ordered for such service.

INFANT DEATH RATE DOWN AGAIN

The U. S. Public Health Service has released figures indicating a further decline in the infant mortality rate in 1948—32 deaths per 1,000 live births compared to 32.2 in 1947 and 47 in 1940. This represents a decline of

nearly one-third in less than a decade. Preliminary figures indicate a continuing drop for 1949 as well.

The range in 1948 among the 48 states was from 24.3 in Connecticut to 70.1 in New Mexico. In 1940 the infant mortality rate was below 35 in only 3 states; by 1948, 32 states had a rate below this figure.

HOUSEHOLD SEWAGE DISPOSAL SYSTEMS

Studies of household disposal sewage systems were begun in 1946 by the Public Health Service and the Housing and Home Finance Agency. Available information then indicated that more than 4 million United States families disposed of their sewage through individual household septic tanks. Much had been published describing the proper way to install and maintain these tanks and tile fields but no thorough study had been undertaken to establish factual data on their operation from which explanations of satisfactory or unsatisfactory operation could be determined. "Studies on Household Sewage Disposal Systems, Part I, 1949" is the first of a series of reports on this which has been conducted at the Environmental Health Center, Cincinnati. The studies will continue toward the ultimate goal of developing scientific data that will form the basis for the establishment of adequate design and performance standards. U. S. Government Printing Office, Washington 25, D. C., $1.25.

ADAH L. HERSHEY MEMORIAL LIBRARY

An Adah L. Hershey Memorial Library has been established at the Des Moines Public Health Nursing Association in memory of Adah L. Hershey who served as Director of the Association from 1913 until her death in 1947. Miss Hershey's life was devoted to better nursing service in the community. The library will help to perpetuate her memory and at the same time will constantly add a spark of enlightenment to a vital service by providing current educational material so that nurses may keep abreast of the times. The Memorial Library will be maintained and added to by gifts to the library sent in place of flowers to funerals and to bereaved families. Gifts for the library fund should be sent to Director, Public Health Nursing Association, 105 City Hall, Des Moines 9, Ia., with the names of the persons in whose memory the gifts are made and the name and address of the sender.

A.A.P.H.D. ELECT OFFICERS

At the recent Chicago meeting of the American Association of Public Health Dentists, the following officers were elected:

President: Robert A. Downs, Denver, Colo.
President-elect: William A. Jordan, Minneapolis, Minn.
Secretary-treasurer: Carl L. Sebelius, Nashville, Tenn.
Editor: Richard C. Leonard, Baltimore, Md.
Executive Committee: A. Harry Ostrow, Washington, D. C., Linwood Grace, Harrisburg, Pa.

The next annual meeting will be held in Atlantic City, N. J., on October 29, 1950.

NEW CHAPTER OF RESEARCH SOCIETY

A branch of the Scientific Research Society of America has been installed at the Communicable Disease Center of the U. S. Public Health Service in Atlanta, Ga. With 93 charter members the new Atlanta Branch is the sixth chapter to be established in the United States. Raymond A. Vonderlehr, M.D., Medical Director in charge of the Communicable Disease Center, is the President and Marion M. Brooke, Sc.D., Secretary-Treasurer.

WIPING OUT YAWS IN HAITI

In April a joint attack by the Haitian Government and WHO and its International Children's Emergency Fund

was begun in Haiti on those infectious diseases that yield to penicillin with particular emphasis on Yaws. The aim is for the complete elimination of this disease which is indigenous to Haiti and affects about 80 per cent of the population.

Under the title "Health Drive in Haiti" the *New York Times* of April 15 carried the following editorial on this program as an illustration of help to people of underdeveloped areas:

The scheduled two-year campaign in Haiti to wipe out venereal disease and yaws can well prove to be the most significant thing of its sort yet attempted. In the beginning, of course, emphasis is likely to be placed on the anti-venereal aspect of the drive because of its social implications and because Haiti has a reported disease incidence of about 25 per cent. The eradication of yaws can be no less important to human health and happiness.

Yaws is a disfiguring and enfeebling disease. Those who have it are under a terrible handicap in just being normal and happy human beings. Six persons out of every seven in Haiti suffer from it, according to the surveys. Yet the treatment is relatively simple, response is usually prompt and results are usually good. Something can be done for those six out of seven in Haiti. The cost in money will not be high. The expenditure in terms of planning, effort and devotion will and ought to be very great. The results can be stupendous.

This is the type of thing that ought to be in the minds of those who are thinking about help to the people of underdeveloped areas. It is possible to bring specific technical knowledge to bear on human problems in places where it might not otherwise appear for a long time. The application of that knowledge can make a difference in the lives of individual persons quickly and often profoundly. Curing the lesions of yaws, for example, is changing the possible relationship of a person to his whole world.

Moreover, what can be done in Haiti can be done elsewhere. The conquest of certain types of human ailments has already changed the course of all of our lives, and there is still more change ahead. The arts of healing can be the means of increasing the great total of good and happiness in many parts of the world where misery and despair are the usual outlook. Meanwhile, Haiti can profit and all of us can learn through this boldly conceived program.

NEW OFFICERS FOR SCHOOLS OF PUBLIC HEALTH

At the April annual meeting of the Association of Schools of Public Health held at the Department of Public Health, Yale University, New Haven, Conn., James Stevens Simmons, M.D., Dr.P.H. was reëlected President; E. S. Rogers, M.D., M.P.H., Vice-President, and Ira V. Hiscock, Sc.D. of Yale University, Secretary, the latter succeeding Gaylord W. Anderson, M.D., Dr.P.H., of the University of Minnesota.

At this meeting the University of Pittsburgh Graduate School of Public Health was elected to membership in the Association.

PERSONALS

WALTER ALVAREZ, M.D., senior consultant, Division of Medicine in the Mayo Clinic, has been appointed medical editor of "GP", the new journal of the American Academy of General Practice.

DANIEL BERGSMA, M.D., M.P.H.,* has been reappointed by Governor Driscoll and confirmed by the New Jersey Senate, as State Commissioner of Health.

GLIDDEN L. BROOKS, M.D.,† has resigned as associate director of the American Academy of Pediatrics Committee for the Improvement of Child Health, and as associate in pediatrics, University of Pennsylvania School of Medicine, to become coördinator of the Medical Center Hospitals and Clinics and professor of hospital administration, University of Pittsburgh Graduate School of Public Health.

EDWARD W. COLBY, M.D., M.P.H.,† of the New Hampshire Board of Health, has resigned to become Health Officer of Portland, Me.

ERNEST COTLOVE, M.D., JAMES O. DAVIS, M.D., and THOMAS J. KENNEDY, JR., M.D., have been appointed to the staff of the Research Branch of the National Heart Institute and assigned to the Section on Kidney and Electrolyte Metabolism, the second of five laboratory-clinical sections to be established within the Heart Institute's research program.

SETH L. COX, M.D.,† executive secretary of the Kansas Tuberculosis and Health Association for the past 3 years, has resigned

* Fellow A.P.H.A.
† Member A.P.H.A.

because of ill health. He has been succeeded by WALDO W. WILMORE,† associate executive secretary since 1948 and formerly personnel director, Kansas State Board of Health.

J. ALFRED CUTSAIL and KENNETH R. WAGAMAN, have been appointed sanitarians in the Frederick County (Md.) Health Department.

SADIE P. DELANEY, chief librarian of the Veterans Administration hospital in Tuskegee, Ala., has been selected "Woman of the Year—1949" by the National Urban League, in recognition of her outstanding work with blinded and mentally ill patients.

BENJAMIN M. DRAKE, M.D.,* formerly director of Rockingham-Caswell (N. C.) Health Department, has been appointed deputy Health officer and HENRY C. HUNTLEY, M.D.,† formerly health officer of Lenawee County (Mich.) has been appointed director of disease control, West Virginia State Health Department.

JOHN E. EGDORF, formerly director of the rehabilitation department, Tuberculosis Institute of Chicago and Cook County, has been named executive secretary of the Institute.

ROBERT F. FRECKLETON, M.D., deputy commissioner, Rensselaer County (N. Y.) Health Department since 1947, has been appointed commissioner of the Columbia County Health Department in the same state. He succeeds DOUGLAS H. FRYER, M.D.,† who resigned to become health commissioner of Waterbury, Conn.

WILLIAM GAHR, director, division of municipal engineering, North Dakota State Health Department, has resigned to become sanitary engineer of the Colorado State Health Department. He has been succeeded by ART WILLIAMSON, who formerly was director of the general sanitation division. He in turn is succeeded by Everett Lobb,† Fargo city sanitation engineer.

FREDERICK O. GRAEBER, M.D.,† formerly director of the Malheur County, (Ore.) Health Department, has been appointed director of maternal and child health, Idaho Department of Public Health to succeed MADELENE M. DONNELLY, M.D.†

JOHN B. HALL, M.D.,* who has been serving as assistant director, has been appointed director of the Cook County (Ill.) Department of Public Health, succeeding E. A. PISZCZEK, M.D.,* resigned to become tuberculosis controller of the Suburban Cook County Sanitarium District.

CARLYLE JACOBSEN, PH.D., has resigned as executive dean, Division of Health Sciences and Services, State University of Iowa, to become executive dean for medical education at the newly established New York State University which will have a medical center each in Brooklyn and Syracuse.

AVA JOHNSON, formerly public relations director of the Iowa Tall Corn Network and Radio Station KWDM in Des Moines, has been appointed health educator in the Division of Public Health Education.

WILLIAM A. JORDAN, D.D.S.,† director of the Division of Dental Health, Minnesota State Department of Health since 1946, was named president-elect of the American Association of Public Health Dentists, at the annual meeting of the association held in Chicago recently.

CHESTER D. KELLY, director of field service, Indiana Tuberculosis Association, has been named acting executive secretary of the association, succeeding MURRAY AUERBACH, deceased.

W. F. KIMMEL, M.D., is director of the division of tuberculosis control of the Montana State Board of Health.

HOWARD M. KLINE, PH.D.,† senior scientist, chief, Technical Missions Branch, Division of International Health, left in March to make a survey of health needs and programs in Southeast Asia and other areas. His trip is taking him to Athens, Cairo, Karachi, New Delhi, Bombay, Colombo, Madras, Calcutta, Rangoon, Batavia, and Manila.

ROBERT PORTER LANE, consultant to the Board of Directors of the Allegheny County (Pa.) Community Chest for the last 9 months was recently appointed its executive director.

ESMOND R. LONG, PH.D.,* director of the Henry Phipps Institute for the study, treatment, and prevention of tuberculosis, and editor, "American Tuberculosis Review," has received the 26th annual Strittmatter Award of the Philadelphia County Medical Society.

CLARKE W. MANGUN, JR.,* Surgeon, P.H.S. has been transferred from the Division of Tuberculosis Control to the Division of International Health detailed to the Department of State, Washington, D. C.

ROY MANTY, formerly director of patient services, Michigan Tuberculosis Association, is now training administrator, Michigan Department of Health.

FRED MAYES, M.D.,* has resigned as Wichita City-Sedgwick County (Kans.) medical director, to become director of Public Health of Brookline, Mass., and assistant professor of public health practice, Harvard University School of Public Health.

KENNETH R. MILLER, has been appointed to the newly established post of education director for the Philadelphia Department of Public Health. He was formerly field consultant and then director of information

services for the American Social Hygiene Association.

NORMA JEAN PAINTON, formerly assistant professor of public health, University of Oklahoma, has been appointed consultant in education in the Bureau of Public Health Nursing, New York State Health Department.

CLIFTON T. PERKINS, M.D., has resigned as commissioner of mental health of Massachusetts.

EDWARD PRESS, M.D.,* formerly Regional Medical Director, Children's Bureau, Chicago, has been appointed associate medical director of the Illinois Division of Services for Crippled Children in charge of an area which includes Chicago and 9 surrounding counties.

CLIFTON R. READ, who was named magazine editor of the American Cancer Society early in 1948, has been appointed publicity director of the society.

JOHN T. SMILEY, M.D., former assistant superintendent of Ancker Hospital, St. Paul, is the new director of Minnesota State Health District No. 6 comprising Anoka, Chisago, Dakota, rural Hennepin, Isanti, Kanabec, rural Ramsey, Washington, and Wright Counties, with headquarters in the Board of Health building on the University of Minnesota campus.

MAURICE I. SMITH, M.D., chief pharmacologist in the Public Health Service, recently retired after 30 years of research work at the National Institutes of Health and its predecessor, the Hygienic Laboratory.

JAMES H. STONE,† formerly instructor in public health, Medical College of Virginia, has been appointed program field consultant in the Public Health Division, American Heart Association, to assist in organizing local heart associations and developing community cardiac programs.

LEWIS K. SWEET, M.D.,† since 1938 chief medical officer of Gallinger Municipal Hospital, Washington, D. C., has been named chief of the newly established clinical unit, Microbiological Institute of the National Institutes of Health, effective July, 1950.

EDITH WILKINS, R.N., former public health nurse in Columbus, Kans., is now public health nurse in the Mayes County (Okla.) Health Department.

DEATHS

F. KENNETH ALBRECHT, M.D.,† recently appointed by the American Academy of General Practice to edit its official journal, "GP" and also editor of "Current Medical Digest," died recently as a result of an automobile accident (Health Officers Section).

SIR ALLEN POWELL,* London, England. Elected Honorary Fellow in 1931 (Unaffiliated).

ROBERT E. RHYNE, M.D.,† Gaston County (N. C.) Health Officer (Health Officers Section).

EDMUND SCHREINER, administrative officer, New York State Health Department until his retirement in December, 1949, died at his home in Newark, N. J. on April 13.

DONALD STUKEY, supervisor of venereal disease investigators assigned to the Maryland Health Department by the U. S. Public Health Service, died on February 11 as a result of an automobile accident.

LESTER TAYLOR, M.D.,† founder and president of the Cleveland Health Museum, died suddenly while on vacation at Pinehurst, N. C., April 11 (Public Health Education Section).

JULIET A. WHITTEKER, R.N.,† Public Health Nursing Supervisor. Barnstable County (Mass.) Health Department (Public Health Nursing Section).

CONFERENCES AND DATES

American Public Health Association. Headquarters, Kiel Auditorium, St. Louis, Mo., October 30–November 3.

Coming in June, July and August:

American Congress of Physical Medicine. Hotel Statler, Boston, Mass. August 28–Sept. 1.

American Hearing Society, National Conference. Chicago, Ill. June 15–17.

American Heart Association. San Francisco, Calif. June 22–25.

American Library Association. Cleveland, Ohio. July 16–22.

American Medical Association. San Francisco, Calif. June 26–30.

American National Red Cross. Detroit, Mich. June 26–29.

American Physical Therapy Association. Cleveland, Ohio. June 25–30.

American Public Welfare Association. Central States Regional. Neil House, Columbus, Ohio. June 12–13.

American Society for the Study of Sterility. Sir Francis Drake Hotel, San Francisco, Calif. June 24–25.

Community Chests and Councils of America, Inc.:

Blue Ridge Institute. Blue Ridge, N. C., July 24–28.

Great Lakes Institute, College Camp, Wis. July 24–28.

Fifth International Congress for Scientific Research and the Social Fight Against

* Fellow A.P.H.A.
† Member A.P.H.A.

Cancer. Sorbonne—Paris, France, July 17–22.

Governors' Conference. White Sulphur Springs, W. Va. June 18–21.

International Congress of Housing and Town Planning. Amsterdam, Holland. August 27–Sept. 2.

International Conference of Social Work. Paris, France. July 16–22.

Massachusetts Public Health Association with the New England Health Institute. University of Massachusetts Amherst. June 14–16.

National Education Association. St. Louis, Mo. July 3–7.

New England Health Institute with the Massachusetts Public Health Association. Amherst. June 14–16.

New England Industrial Wastes Conference. Massachusetts Institute of Technology, Cambridge, Mass. June 26–28.

New York State Health Conference. Lake Placid, N. Y. June 5–8.

Sixth International Congress of Radiology. London, England. July 23–30.

Third International Institute on Organization and Administration of Hospitals. Ministry of Education, Rio de Janeiro, Brazil. June 18–July 1.

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